Digitized by the Internet Archive
in 2013

http://archive.org/details/conchologistsexc7818aver

Am. Cat. Li. Cat.

05

THE NAUTILUS.

A MONTHLY JOURNAL
DEVOTED TO THE INTERESTS OF
CONCHOLOGISTS.

VOL. VII.

MAY, 1893, to APRIL, 1894.

PHILADELPHIA:

Published by H. A. PILSBRY and C. W. JOHNSON.

594.05
NA
v. 7-8

INDEX

TO

THE NAUTILUS, VOL. VII.

INDEX TO TITLES AND SPECIES DESCRIBED.

Acanthochitidæ, (notes on) with description of new species 31
Acanthochites exquisitus Pilsbry, n. sp. 32, 95
Acanthochites rhodeus Pilsbry, n. sp. 32
Acanthochites (Notoplax) Hemphilli Pilsbry, n. sp. . . 32
Acanthochites (Meturoplax) retrojectus Pilsbry, n. sp. . 107
Acanthochites granostriatus Pilsbry, n. sp. . . . 119
Acanthochites Coxi Pilsbry, n. sp. 119
Acanthochites Matthewsi Bednall & Pilsbry . . . 120
Actæon (Rictaxis) punctocælatus Cpr. 75
Agriolimax agrestis in Jamaica 21
Alcyna ocellata A. Ad. 108
American Association of Conchologists 23, 83
Amnicola olivacea 121
Amphidoxa 92
Ancylus Woodsi Johnston 122
Angasia Cpr. 139
Aplodon Spix. 20, 30
Argonanta argo found alive at Palm Beach, Fla. . . 47
Astyris gouldiana, remarks on 141
Beach shell collecting in connection with a study of ocean phenomena, ... 41
Bulimulus proteus Broderip, and its distribution . . 26
Bulimulus (Scutalus) Montezuma Dall 26
Bulimulus (Næsiotus) duncanus Dall, n. sp. . . . 52
Bulimulus (Næsiotus) amastroides Ancey var. Anceyi Dall 53
Bulimulus (Næsiotus) jacobi var. vermiculatus Dall . . 53
Bulimulus olla Dall 54
Bulimulus (Næsiotus) tortuganus Dall, n. sp. . . . 54

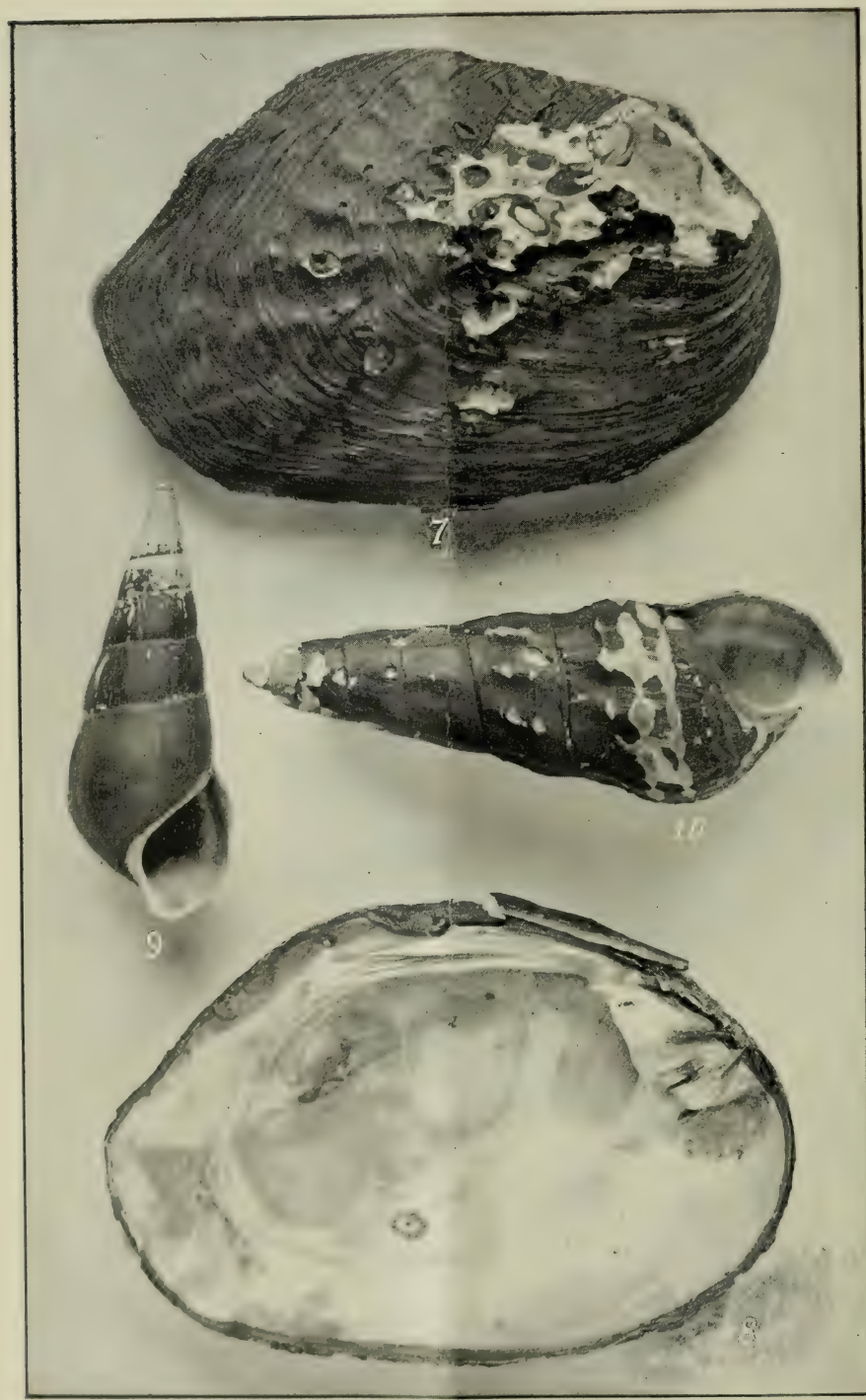
732423

Papuina, notes on 73
Papuina cerea Hedley, n. sp. 136
Patella hermadecensis Pilsbry, n. sp. 109
Patella kermadecensis, note on 142
Petropoma Gabb. 84
Phacellozona Pilsbry, n. g. 139
Plagiodon 20, 30
Pleurotoma Clarkeana Aldrich, n. sp. (Pl. IV) . . 98
Polygyra subpalliata Pilsbry, n. sp. 5, 7
Polygyra, descriptive notes on certain forms of . . 139
Polygyra appressa Say 140
Polygyra appressa perigrapta Pils. n. var. 140
Polygyra tridentata edentilabris Pils. n. var. . . . 140
Polygyra hirsuta altispira Pils. n. var. 141
Polynices 8
Polyplacognatha 88
Potomanax Pilsbry, nov. subg. 63
Potomanax Rovirosai Pilsbry, n. sp. (Pl. III, figs. 8, 9) . 64
Rare old book 47
Reply to Professor Wheeler 22
Review of von Ihering's classification of Unionidæ and Mutelidæ 17
Rhenea 78, 89
San Pedro as a collecting ground 74
Sepia Hercules Pilsbry, n. sp. 144
Sheepscote River 81
Shells of Henry Co., Ind. 68
Shell collecting in Northern Alabama 121
Shells of the Saginaw Valley, Michigan 125
Small grey slug in Jamaica 21
South American notes 2
Spixoconcha, n. g. 30
Strobilops, preliminary note on the species of . . . 56
Strobilops Hubbardi, variations of 84
Strobilops Hubbardi 94
Succinea, notes on North American species of . . . 43
Succinea stretchiana 46
Succinea corbis Dall, n. sp. 55
Tasmanian Land Mollusca, Contribution towards a revision of the 87

Tasmanian land shells, Preliminary notes on . . . 77
Tetraplodon Spix 30
Tulotoma in the Tennessee drainage 130
Unio Pilsbryi Marsh. (Pl. I, figs. 7, 8) 1
Unio muddle 9
Unionidæ 20
Unionidæ and Mutllidæ, notes on the genera of . . 30
Vallonia americana Ancey 94
Vitrina limpida in Pennsylvania 47, 94
Volutoderma Woolmani Whitf. n. sp. (Pl. II, figs. 4, 5) . 37, 51
Walton, Robert. (In memoriam) 90
Yoldia montereyensis Dall, n. sp. 29
Zonitidæ, some notes on 13
Zonites suppressus 14

INDEX TO CONTRIBUTORS.

Aldrich, T. H. 97
Campbell, John H. 52
Clapp, Geo. H. 74, 94
Cockerell, T. D. A. 21, 43, 94, 103, 113
Dall, Wm. H. 26, 29, 52, 86, 136
Ford, John 39, 78, 130
Gardner, A. H. 141
Hanham, A. W. 65
Hedley, Chas. 35, 73, 136
Johnson, C. W. 51, 90
Monks, Sarah P. 74
Pilsbry, H. A. . . 5, 30, 56, 61, 67, 107, 109, 119, 138, 143
Pleas, E. 68
Raymond, W. J. 133
Rush, Dr. Wm. H. 2
Sampson, F. A. 33
Sargent, H. E. 121, 130
Simpson, Chas. T. 17, 22, 110
Smith, Edgar A. 64, 102
Stearns, Robt. E. C. 10
Sterki, Dr. V. 4, 13
Stupakoff, S. H. 135
Suter, Henry 77, 87, 122
Taylor, Rev. Geo. W. 85, 100, 142
Walker, Bryant 125
Webster, G. W. 84, 94
Wheeler, Chas. LeRoy 9
Whitfield, Prof. R. P. 37
Williamson, Mrs. M. Burton 27, 41
Winkley, Rev. Henry W. 58, 81
Wood, Williard M. 48, 70



PILSBRY.—NEW UNIO AND PACHYCHILUS.

THE NAUTILUS.

VOL. VII. MAY, 1893. No. 1

ILLUSTRATIONS OF NEW SHELLS.[1]

Unio Pilsbryi Marsh, Plate I, figs. 7, 8.

This species is a member of the plicate group of Uniones. It is a decidedly compressed, oblong shell, black in color, having very distinctly marked lines of growth, which are spaced over the greater part of the disk, but become crowded on the lower margin. It has numerous oblique waves, which generally bifurcate indistinctly toward the posterior-lower end. The waves are more or less cut by short impressed furrows, as in *U. undulatus*, etc. The nacre is white and very thick anteriorly, but in the cavity of the valves and posteriorly it is thin and stained with blue and olive-green. The lateral teeth are also olive-green.

It was collected by Mr. Elwood Pleas in the Little Red River, Arkansas, and the original description, by Mr. Wm. A. Marsh, will be found in the NAUTILUS, V, p. 1.

Unio Pilsbryi is not closely allied to any other American species. It has a striking resemblance to *Unio Leai* Gray of China.

Specimens, including the individual figured, are in the special exhibit of United States shells, formed by the American Association of Conchologists, in the Museum of the Academy of Natural Sciences of Philadelphia.

[1]The accompanying plate is reprinted by permission from the Proc. Acad. Nat. Sci. of Philadelphia.

The Melanian illustrated (figs. 9, 10) will be noticed in a later article.

SOUTH AMERICAN NOTES.[1]

BY DR. WM. H. RUSH, U. S. N.

I have been adding lately to my collections many specimens, nearly all the work having been done near Maldonado, but few species being added, and they include the Unios Rhuacoica and Charmana, a fine, large Anodonta, Azara labiata, Solecurtus Platensis; and some fine, large, clean specimens of Mytilus Platensis, taken from the flukes and shank of an old anchor grappled here. This old anchor proved to be quite a blessing in disguise, for on it were some fine specimens of Chiton Tehuelchus and C. Isabellei, and a few large Ostrea Puelchana. In my dredgings since, I have found a few more Chitons, but always on rocky bottoms and attached to stones, so that while adding only a few of these, I have been adding nothing to my stock of the mud-lovers, such as Corbula, etc.

Mr. Burnett, the British Vice-Consul here, while visiting the ship, told me that he had occasionally found in his garden a large black slug. The day following proving pleasant found me on my way to hunt the monster, but anxious as I was for the little game of hide and seek, I found time on the way to loiter in a small patch of native trees to hunt for my old friends, the Helix costellata d'Orb., to add to the number of my accumulating exchanges. Finally I found Mr. Burnett and we started for the old ruins of a house. I did not anticipate much success when we entered the enclosure, for the ruins were in the center of the town of Maldonado, whose population is about twelve hundred, and the surroundings were extremely dry, there having been no rain for months. However, with willing hands we started in and after turning over many large masses of brick, my companion said, after the exertion of moving an extra heavy one allowed him to recover enough breath to speak, "There is one of those large mail-coated insects I was speaking of," I promptly said, "Hold on!" and proceeded to turn out with my

[1]The following extracts are from a letter received from our esteemed correspondent, Dr. Wm. H. Rush, dated U. S. S. Yantic, Maldonado Bay, Uruguay, March 7th, 1893.

forceps what seemed to be the veritable monster in all his glory of æstivation, the Vaginulus solea d'Orbigny, or more correctly according to Tryon, Veronicella. One more specimen was found with its egg-nest. Both specimens were curled, and the tentacles were not visible, in fact, it looked like a lifeless mass of very dark grayish-brown opaque glue, with lighter gray spots: about the size of that warred-upon Bland dollar, with a notch in one side and a crack extending nearly to the center. Turning it over it presented the well known under surface as shown in d'Orbigny's figure. Soon two tentacles came forth, which stuck up in the air, and each had a bright black eye visible in the exact center of its free end; then two more were observed, which projected downward and were broader and stouter than the others, and appeared bifurcated; these latter were constantly in motion, apparently acting as feelers, and later when the animal was moving along on a glass plate seemed to act as suckers. Finally he slowly straightened out until he was ten centimeters long and a little over two wide. I next took a look at the nest, of which I had found several in the woods, only never very large, usually containing about ten or fifteen eggs, but in this one I counted seventy-five, although, much to my discouragement as an amateur artist, in my sketch of it I can only account for forty-five—it was about the size of a silver half dollar and hemispherical, the eggs being regularly arranged around the circumference and held together by a heavy mucous-like rope. The eggs were oval in shape, some perfectly clear and transparent, others yellowish and more or less opaque, and all were covered by the stercoraceous deposit of some insect, I judged. Unfortunately, it broke to pieces before I reached the ship on account of the rough handling of curiosity. One specimen of the solea was much darker in color than the other, and the lighter seemed to fade before I had my water color sketch finished; subsequent finds may show considerable variation in coloration. I killed the first specimen in a solution of bichloride of mercury, 1 to 500, and then dropped it into glycerin hoping thus to preserve its colors, but it has contracted and become very dark: the second I killed in the same solution, in which it still remains. In dying it threw out much mucus, most rapidly and in greatest quantity from the extreme end so that I suspect there may be a mucous pore there; it also seemed to come from its whole surface enveloping it quickly in a cloud, completely hiding it, and in sufficient quantity to render the fluid as nearly opaque as milk.

The mantle retracted from the head, which thus exposed is one cm. long—the jaw was easily seen, by the unaided eye, as a brown crescentic band in the superior lip, and with an ordinary magnifying glass the ridges were easily seen. The whole animal is faded and contracted, but still pliable. The next I obtain will be killed in accordance with your directions in water, and will be kept for you.

Associated with the solea, and in damp places, I found some numbers of the slug which is given in d'Orbigny as Limax unguis Fer., but they are not as large as represented in the plate. I found this latter species very plentiful in the Prado at Montevideo and always several individuals together. This latter is in contrast with Veronicella, which were alone and widely separated.

I had a few Chitons of both species mentioned in the first part of this letter, alive in my aquarium bottle, for a few days in my room, with a long strip of glass upon which I coaxed them to crawl for the purpose of sketching for water-color work, and was surprised at the rapidity with which they travel, and it was rendered all the more decided when I compared it with the movements of the Veronicella which I had in another bottle alongside.

CONULUS FULVUS MULL.[1] VAR. DENTATUS, N. V.

BY DR. V. STERKI.

Among a number of Con. fulvus from Jackson Co., Alabama, kindly sent by Mr. H. E. Sargent, last year, there were a few specimens with distinct "teeth" in the base of the last whorl. Since then, Mr. Sargent has paid attention to the matter, and a few days ago sent me some more specimens in two lots, one from the valley and another from the hills. The latter were most small, young and half grown, and most of them showed 1–2–3 small, white, testaceous deposits in the base of the last whorl, at somewhat irregular intervals, roundish or elongate in a radial direction. They are not high, tooth-like, but quite distinct, whether seen through the shell, or if near enough, from the aperture inside, and recall the same feature

[1]The species was first described by Müller, not by Draparnand. It may be said again, that *Conulus* is a genus founded on anatomic characters.

in the smaller Gastrodontas, although I have never seen more than one tooth on the same radius. But, as said, in some they are in the form of radial bars, and when two or three are present they are always of the same character, either round or transverse. Two examples, mature or nearly so, but weathered and opaque, have at least one distinct round deposit each, about ½ volution above the aperture. In the specimens from the valley, about a dozen in number, varying from young to large, and by the way a few of them with very high spire, there is not a trace of teeth to be seen.

This is certainly a very interesting fact, and the character described could mean a different species, and for the Nouvelle Ecole would be sufficient to establish a new genus. But as the shell is, in all other regards, formed like that of typical C. fulvus, we have to regard it as a variety of that species, the more so since in the lot there are a few examples without teeth and differing in no way from the type. This, and the variation in number, shape and size, show it to be a newly acquired character, which some time may be that of a distinct species.

It remains to know whether the form be found also in other places of our country—which is quite probable—and to ascertain also the nature of the localities where it lives. Another question is whether it also inhabits the Old Continent.

It may be mentioned here also that there are two different forms of the common C. fulvus, one more pale horn, the other deep wine or amber colored, and there are also differences in surface sculpture. It would be of interest to know how far these forms are constant and in correspondence with the nature of their habitats. I have seen them in both Europe and North America.

New Philadelphia, O., March 21, '93.

POLYGYRA SUBPALLIATA, N. SP.

BY H. A. PILSBRY.

Some time ago the writer received from Prof. A. G. Wetherby, a suite of the land snails found at his home, "Roandale Farm," Magnetic City, North Carolina; and with them a letter giving the collector's impressions and conclusions in regard to some, and queries

respecting other forms. A number of "*Zonites*" were included, among them specimens of *Z. carolinensis* Ckll., and of two new species, one of about the same size as *suppressus*, the other larger. Of these an account will be given later. Among the Helices, one of the most interesting forms was labelled "*H. wetherbyi* Bld. var. *Don't believe it!*" Upon glancing at the specimens I was compelled to join Wetherby in his scepticism, for the shells are certainly unlike *H. wetherbyi*, and belong to quite a different group of species. The first notice of these so-called *wetherbyi* appeared in a paper written by Mr. Wetherby on the shells of Roan Mountain, and published in the Journal of the Cincinnati Society of Natural History, vol. iv, as long ago as 1881. The paragraph is as follows:

"*Mesodon wetherbyi* Bland.—Shells which have been referred to this species occur somewhat sparingly at this locality. Like the specimens from the original station, the shells are covered with a thick coating of dirt, imbedded in the hirsute covering of the epidermis, which being carefully washed away leaves the shell of a pale greenish white color. These shells have a lamellar projection on the inferior surface of the peristome much like that of some varieties of *T. appressa*, and which is a character very distinct from that of the same region in the type. A very careful examination of the genitalia shows them to be much more like those of *Triodopsis*. Indeed, looking over the whole field, it seems not improbable that here we have another case of the union of characters of *Mesodon* with other groups, like that of *Stenotrema*, mentioned in my notes, No. 1. Mr. Binney says, *Terr. Moll.*, vol. v, p. 301, "*Triodopsis* does not differ from *Mesodon* or *Polygyra* in the character of its jaw." Again, p. 306, he says that the genitalia of *T. appressa*, resemble, in certain features, those of *Mesodon sayii=M. diodonta*. This shell certainly presents as many features that would ally it to *Triodopsis* through *appressa*, as to *Mesodon* through *dentifera*. In fact, I am inclined to the belief that the shell is not *Mesodon wetherbyi* at all, but a distinct species, probably a *Triodopsis*, and having the closest analogy to *M. dentifera* Binney, which certainly has some very strong claims to relationship to *Triodopsis* through *T. appressa*. The station of this species is always *in the dirt* under and beside rotting logs. It is very sluggish and timid, and very rare."

It will be seen that Wetherby recognized the Triodopsoid affinities of the snail; but in the writer's opinion it is more nearly allied

to the *palliata* than the *appressa*. The species may be diagnosed as follows:

Polygyra (*Triodopsis*) *subpalliata* n. sp. Shell depressed, thin, pale green or buff-green, somewhat translucent. Surface shining, minutely roughened by narrow granules elongated in the direction of growth-lines. Spire convex, composed of slightly over 5 convex whorls, the last rounded at the periphery, deflexed in front, and very deeply constricted behind the lip. Aperture oblique; outer lip flatly reflexed, white, wide, the arcuate basal lip bearing a long plate-like callus, as in *H. palliata;* parietal wall bearing a large, high, curved tooth, like that of *H. palliata.* Alt. 9½, diam. 15 mill. (largest specimen). Alt. 7, diam. 13 mill. (smallest specimen).

DALL'S TERTIARY MOLLUSKS OF FLORIDA.[1]

This second volume of Dr. W. H. Dall's great work upon the Tertiary Mollusks of Florida is much wider in scope than the previous part, including much matter upon other East American faunas of the same epoch, notably the Pliocene of the Carolinas. The introductory chapter graphically describes the series of changes of shore line and elevation of our southeast coast, from the close of the Eocene to the present time; and this has been noticed and quoted from in a previous number of the NAUTILUS.

The systematic enumeration and description of species occupies the greater portion of the work, the subject being completed down to the Pelecypods, which will form the third part of the work.

The new genera and subgenera proposed are as follows: *Glyptostyla* (type *G. panamensis* Dall), a peculiar form like *Pyrula* outside but ponderous and with the plaits of *Latirus. Trachyodon,* new subgenus of *Chiton* for *C. eocenensis* Conr.

The generic synonymy of *Vivipara* is worked out in full, the author concluding that *Vivipara* (Martini) Lamarck, has priority over the very bad masculine form, *Viviparus* Montf., which has lately been adopted by English authorities. Incidentally the history of the name *Bulimus* is discussed, and shown to be totally inapplicable to the genus of land snails generally known by that name. *Clava,* of Martyn, is used as a generic name to supercede

[1]Transactions of the Wagner Free Institute of Science of Philadelphia, vol. 3, pt. ii. Issued January, 1893.

Vertagus. The genus *Natica* as used by most writers is definitely divided into two genera, *Natica*, in which the operculum is shelly, and *Polynices* Montfort (1810), in which the operculum is thin, flexible, corneous. The last group contains, of course, the familiar *duplicata* and *heros* of our east coast, and the similar western species. This is a division heartily to be commended, and it is surprising that it has not been placed upon a firm basis long ago.

A very large number of new species are described. The illustrations are excellent, having the merit of great clearness of detail. The appearance of the volume is highly creditable to the Wagner Institute, the officers of which have, with an enlightened appreciation of the importance of the work, spared no pains or expense in its production. Especially are the thanks of both Palæontologist and Conchologist due to Messrs Joseph Willcox and Charles W. Johnson, who collected much of the material, as well as to Dr. Dall who has so ably worked it up.

CESARE MARIA TAPPARONE CANEFRI.

On the 6th of August, 1891, Cesare Tapparone Canefri expired after a long illness. Professor Cesare Tapparone Canefri was born at Alexandria on the 5th of February, 1838, being descended from a noble Piedmontese family. His father was for many years Mayor, and destined his son for an official career. Tapparone, therefore, at the age of 20, entered the University of Turin as a law student; but he had already become interested in the natural sciences, especially botany. At Turin he formed a friendship with Luigi Bellardi and Vittore Ghiliani; and in the elevating atmosphere of that fellowship he developed the enthusiasm and love for science which pervaded his whole after life.

A few years after his graduation, Tapparone was employed in the civil service of Spezzia; and there he was attracted by the rich shell fauna of the Gulf, which had already been studied by Jeffreys and Capellini. Many species not known to these students were found by the young enthusiast, who, in 1865, embodied the results of his research in a "Catalogue of the Mollusca of Spezzia," his first conchological paper. Henceforth, the greater part of his time was given to the study of mollusks. He shortly became an assistant to Professor Lessona, in the Chair of Zoology and Com-

parative Anatomy, in the Royal University of Turin; while here he worked up the mollusks collected by DE FILIPPE during the circumnavigation of the Royal Frigate, 'Magenta.' In 1873, Tapparone began the series of articles upon Oriental land mollusks collected by O. BECCARI and L. M. D'ALBERTIS in New Guinea and adjacent regions; and it is to this series of papers that his reputation is chiefly due.

After a residence of eight years in Turin, Prof. Tapparone went abroad for the purpose of studying the mollusks of foreign museums. He visited the British Museum, the Zoological Museum of Berlin, etc., and finally spent some time in study under SEMPER at Würzburg. Returning to Italy, he went to Genoa, where he devoted himself to the mollusk collection of the Civic Museum. Shortly after, a disease of the circulation and nerves manifested itself, and despite the tenderest care of wife and friends, it proved fatal.

His collection and library have been given to the Civic Museum of Genoa, by his wife.

All students of land shells will regret the death of so conscientious and able a malacologist; and particularly will his loss be felt by those who have profited by his "*Fauna Malacologica della Nuova Guinea*," and the other essays upon allied faunas.

A bibliography and full biographical sketch by ISSEL, with portrait will be found in the Annali del Museo Civico di Storia Naturale di Genova, 1892.

THE UNIO MUDDLE.

BY PROF. CHAS. LE ROY WHEELER.

Under the above heading appears an article in the February NAUTILUS from the pen of Mr. Berlin H. Wright. In a recent number, also, appeared an article from Mr. John H. Campbell suggesting that the Uniologists connected with the American Association of Conchologists meet at Chicago this summer and settle disputed points as to priority of description, nomenclature, and synonymy. Certainly it would be "just too nice for anything" if the aforesaid Uniologists could have a little pic-nic at Chicago, pass a few resolutions forever settling all disputed points, pat each other

on the back, shake hands, adjourn, go home, and sleep more soundly then ever before; but, unfortunately, the ghosts of Dr. Lea, Mr. Conrad, Mr. Say, and others might appear upon the scene, and Mr. Ego might appear in the flesh, armed with carpet-bag, microscope, and manuscript; in which case the big show would not last half long enough to enable the quarrelsome scientists to finish throwing mussel shells at one another.

Seriously, however, this "muddle" ought to be unmuddled; but how is it to be done? Who is there upon whom all concerned will be willing to rest the responsibility of deciding contested points? Can three or five men be found upon whose judgment all will consent to rest? If so, who shall they be?

By the time the "Unio Muddle" shall have been fairly settled the indications are that there will be three or four other first class muddles ripe. Would it not be well for the American Association of Conchologists to do in regard to American mollusks as the American Ornithological Union has done in regard to the American Birds, and settle not only the "Unio Muddle," but all contested points in American Conchology?

Why is it that the reputation of a conchologist should rest upon the naming of new species rather than upon a knowledge of Conchology? and, honestly, may not the making of new species sometimes be attributed more to conceited self-assertion than to a desire to help the science? Suppose we have a committee of the American Association whose duty it shall be to decide upon the merits of so-called new species, and that a name be regarded as only provisional until it be accepted or rejected by such committee. So mote it be.

DESCRIPTION OF A NEW SPECIES OF NASSA FROM THE GULF OF CALIFORNIA.

BY ROBT. E. C. STEARNS, U. S. NATIONAL MUSEUM.

Shell small, elongated, ovate, of seven to eight whorls, with an acutely elevated spire, ornamented with generally three spiral series of granules; occasionally four series are exhibited on the penultimate whorl, and six to seven on the basal. These granules also correspond to a longitudinal arrangement. In some examples the sutural series is a little more prominent and followed by a slight

parallel sulcation. Otherwise sculptured with revolving liræ on the lower half of the basal whorl. Suture more or less distinct, aperture small, ovate, about one-third the length of the shell. Outer lip externally rimmed and internally thickened, crenulated and denticulate on the inner side; pillar and face of basal whorl heavily calloused, with a single plication or fold on the base and four or five obtuse wrinkles above. Aperture notched above with the usual attendant callosity; pillar roundly arcuated, and the whole surface of the parietal region and edge of the lip showing a warm shining brown glaze, light in some examples and quite dark in others; some specimens are much more robust than others and vary also in the elevation of the spire.

Dimensions of largest, altitude 16 mm., breadth 9 mm.

An intermediate example measures, altitude 15 mm., breadth 8 mm.

The majority of the specimens are much smaller than the least of the above.

The nearest ally of *N. brunneostoma* is *Nassa complanata* Powis, and these two species, together with *N. tegula* of Reeve, form a little group possessing similar general characters.

N. brunneostoma is readily separated from its congeners by the highly glazed and solid brown callus that surrounds the aperture.

Habitat.—Gulf of California, near the mouth of the Colorado River; also at Guaymas, on the easterly shore, where numerous examples were collected by Dr. Edward Palmer (Mus. Nos. 23721, 37239, 55951).

Washington, D. C., May 2, 1893.

NOTES AND NEWS.

THE MALACOLOGICAL SOCIETY OF LONDON.—At a meeting held on the 27th February, at 67 Chancery Lane, London, England, W. H. Hudleston, F. R. S., in the chair, the following resolutions were passed:

1. That a Society be formed in London for the purpose of furthering the study of the Mollusca and Brachiopoda in all their branches.

2. That the Society be called the "MALACOLOGICAL SOCIETY OF LONDON," and that the Annual Subscription be 10s. 6d.

3. That those who have signified to Mr. Sykes their willingness to join the Society shall constitute the original members: to wit (list of 70 names).

4. That the original Members, and those who join the Society during the year 1893, be exempt from entrance fee.

5. That the election of Members, subsequent to this the inaugural meeting, be by ballot, under regulations to be drawn up by the Council.

6. That there be an Entrance Fee, and that it be 10s. 6d.

7. That the following constitute the first Council:

President: Dr. H. Woodward, F. R. S.

Vice-Presidents: Lt.-Col. H. H. Godwin-Austen, F. R. S., etc.; W. H. Hudleston, F. R. S., etc.; J. Cosmo Melvill, F. L. S.; E. A. Smith, F. Z. S.

Treasurer: G. F. Harris, F. G. S.

Secretary: E. R. Sykes, F. Z. S.

Other Members of Council: H. W. Burrows; G. C. Crick, F. G. S.; W. Crouch, F. Z. S.; Rev. Canon Norman, D. C. L., F. R. S.; J. H. Ponsonby, F. Z. S.; G. B. Sowerby, F. L. S.; B. B. Woodward, F. G. S.

8. That the Council be instructed to draw up the rules, and submit them at the next Meeting of the Society.

9. That the Meetings be held on the second Friday in each month, commencing in April, 1893.

10. That the Resolutions passed at this Meeting be printed and circulated amongst the Members.

Votes of thanks were passed to the Chairman for presiding, and to Mr. G. F. Harris for the use of the room.

The next meeting will therefore take place on Friday, April 14th, at 8.00 p. m., and succeeding Meetings on the second Fridays in May and June, after which there will be no Meeting till November. Until further notice, the Meetings will be held, by the kind permission of Mr. Harris, at 67 Chancery Lane (second floor).

Mr. Charles W. Johnson is spending a few weeks in Washington, D. C.

The death of the veteran botanist, Alphonse de Candolle, April 9, 1893, is announced.

Mr. John Ritchie, Jr., of Boston, paid a flying visit to his Philadelphia and Washington friends recently, being in the latter city attending the meeting of the National Academy of Sciences.

THE NAUTILUS.

VOL. VII. JUNE, 1893. No. 2

SOME NOTES ON ZONITIDAE.

BY DR. V. STERKI.

1. The generic name *Zonites* Montf., has, by European malacologists, long ago been restricted to a group of circum-Mediterranean forms, such as *algirus, verticillus, gemonensis,* etc., none of them being represented in the recent North American fauna; and as it seems to be a well-defined genus, we will do well to recognize this restriction of the group. The old genus *Zonites*, or Hyalinia, is being disintegrated, just as the old genus *Helix* has been. For *nitidus* Müller, the genus *Zonitoides* has been established on characters chiefly anatomic, the presence of a dart sac and dart, and, as it seems, peculiarities of the radula. As the same dart sac and dart is present in a number of North American species, such as *elliotti, ligerus, demissus, intertextus, gularis, suppressus, internus,* etc., and, as has been supposed, and I can positively confirm, *arboreus*—they would range under *Zonitoides,* especially if their anatomy prove to agree with *nitida,* also otherwise. Dr. v. Ihering makes the proposition to unite all Vitrino-zonitidae having a dart[1] in a family, as xiphogone forms—"Zon." (or Hyal.) *fulvus* Müll., *gundlachi* Pfr., *sterkii* Dall., belong to the genus *Conulus* Fitz., well characterized anatomically. *Hy. crystallina* Müll., *diaphana* Studer., etc., of the old continent, have their peculiar anatomy also, and range under

[1] Which, however, is not homologous with the dart of the Helicidae, and therefore named *pugio,* by v. Ihering.

the genus *Vitrea* Fitz. On the other hand, as well known, our *Mesomphix* (s. str.) are hardly to be separated generically from *Hyalinia* (*Euhyalinia*), as *glabra*, *draparnaldi*, *cellaria*, etc., and forms like our *wheatleyi*, *petrophila* from *pura*, etc., not to speak of *radiatula* which is equally distributed on the old and new continents. We may, for all these, use the generic name *Hyalinia*, the more since such authorities as W. G. Binney, Tryon and others have done so before, and no embarrassing of the synonymy will result. Yet all these forms still need careful examination as to their anatomy.

2. Some *Zon. suppressus* Say, show not a trace of internal teeth or rather lamellæ, when adult; W. G. Binney (l. c. p. 226) also says that the tooth is sometimes "so little prominent as to be hardly visible." I have in possession specimens from Ohio and Virginia (Petersburgh, collected by myself) of 7–8 mill. diam. and 7–7½ whorls, with the last whorl and aperture well-rounded, without any "teeth," and only a thin callus inside. As to size and shape, they differ essentially from W. G. Binney's description and figure.[2] With these, there were examples of all ages and sizes, inseparately connected with the former, having two strong lamellæ upon a heavy callus. Also in *gularis* and other forms of the group, the lamellæ considerably decrease in size and number with advancing age, and at maturity sometimes are quite short and thin.

3. Mrs. Geo. Andrews, to whom we owe so many valuable finds among land mollusca, sent me, in 1891, a number of "*Zonites gularis* small var." Then I was satisfied that they were not *gularis*; and now, after repeated comparison and examination also of the soft parts on specimens recently obtained, this is beyond a doubt, and as well, that it is a distinct species, not yet described. Here only so much of the description will be given as to serve our purpose. The shell is of the general appearance of a small *Z. ligerus*, of only 9 mill. greater diameter, finely perforated, with a high spire, well-rounded at the apex. Inside there is a rather long fold corresponding to the same (outer) in *Z. gularis*, etc., and a lower one near the columella. In a part of the specimens there is another (outer) long fold, about ½–¾ volution above the aperture, sometimes connected by a fine marking with the one in front; evidently this is the one previously formed and not resorbed, the same thing as in *Z. internus*, etc.

4. A few examples of *Zonites*, I think a form of *demissus*, from

[2] Manual, p. 225; fig. 241, looks like drawn from an immature specimen.

Nashville, Tennessee, and Jackson Co., Alabama, the latter collected by Mr. Sargent, have a strong, thick, white, testaceous deposit inside the base of the last whorl, with some nodules, apparently irregular, but equal in the specimens from either locality, which correspond to teeth or folds. These testaceous deposits in different species are often smaller and thinner in mature shells than in adolescent, and sometimes entirely resorbed; they evidently are the same morphological element as the deposits and folds in Gastrodonta.

5. I believe the fact must impress itself upon anyone that *Zon. suppressus*, especially the form noted above; *gularis*, also more in some forms, much resemble *Z. ligerus, demissus*, etc., and are nearly related to them, much more so than the latter are to the Mesomphix between which they are inserted in systematic works. This feeling found its expression also in W. G. Binney's "L. & F. W. Shells," where *ligera, demissa, intertexta* are ranged under the genus Hyalinia, the Mesomphix under *Zonites*. To this now comes the species announced under 3 above, resembling *ligera* as to the general configuration of the shell, and "Gastrodonta" in the lamellæ, which are of a somewhat peculiar type at that, approaching it to *significans* Bld. Some light on the significance of presence or absence of internal teeth is given also by *Conulus fulvus*, in which, as we have seen, such may be found or wanting in the same form from the same locality. And a character common to the two groups, valuable even of higher order, seems to be the presence of a dart, in the genital organs, which would range them together in the genus Zonitoides. It may be communicated here, previously, that I have found, in the upper part of the penis in *Z. ligerus, suppressus*, the forms mentioned under 3 above, and in *arboreus* a peculiar papilla (Reizkörper of German authors) in which a part is hard, sharp, projecting and (in the 3 former species) impregnated with carbonate of lime.

6. Quite lately, Mrs. Andrews has sent me specimens of a Zonites, collected at Cranberry, Mitchell Co., North Carolina. They can be referred to none of the described species, and may prove to be a new one.[3] The shell, of about 7 m. in diam., has two very small lamellæ or teeth near the aperture, corresponding to the same *Z.*

[3] The n. sp., however, may be "hanged in the smoke till cured," or left in suspense till fully confirmed; it is, *as such*, of little consequence, but of great importance as a form.

gularis, and thus proves to be a Gastrodonta. The shell is thin, transparent, somewhat greenish deep horn colored, of the same appearance as *Z. nitidus* Müll., which species it surprisingly resembles below, while above it appears different by the greater number of whorls. It seems that here we have a "missing" or connecting link between the so-called type of Zonitoides, and its more characteristic North American members.

7. Mrs. Andrews has, of late, again sent me numerous small Zonitidae, collected in the mountains of Tennessee and North Carolina. From these I learned, beside other things, that *Zon. andrewsi* W. G. B., when adult, has very often (or always?) no internal teeth at all. Moreover, the shell attains quite a different configuration: the last whorl is placed considerably deeper on the penultimate, or gradually descends, thus causing the spire to be much more elevated; it becomes also deeper and at last somewhat truncate in the periphery (perpendicular section) and subangular below, comparatively large, just as we find it in some *ligerus*, *gularis*, *suppressus*. At the same time, the base is no more equally rounded, but becomes sloping inward, somewhat infundibuliform, the umbilicus is rather large, and the striation becomes more crowded and coarse, even so that the striæ appear to be raised (*i. e.* the intervals) in place of impressed, as they are on the inner whorls. The whole shell then has quite a different appearance from that commonly known as *Z. andrewsi*, much resembling the description and figure of *Zon. placentulus* Shuttl. (in W. G. Binney's Manual, p. 222). The whorls are fully 9 or more, the diameter 7–7·5 mill. It was somewhat difficult to state these relations, as I had, though, a good number of specimens, no complete series from one locality at disposition. There is no doubt, to say no more, that many such examples have been taken for *Zon. placentulus*. And, as a striking proof of this, I have in my collection four specimens from the mountains of North Carolina received as *Zon. placentulus*, years ago, from a conchologist who studied those land shells; they show more or less the characteristic features noted above, and one of them has a distinct row of denticles denoting it unmistakably as *Zon. andrewsi*.

8. As with the preceding, it is with *Zon. significans* Bld. Only the younger examples, i. e., those commonly found in collections under this name, have the teeth, two series of two, as a rule. In older specimens, of .5–6 mill. diam., they are no more formed, or only occasionally one or another, and then the shells have the characters

of *capsella* Gld., and doubtless have been and will be taken for such. A lot of fine examples, received from the same author, collected in eastern Tennessee, and named *capsella*, are, to all probability, nothing else but adult significans, in which the last whorl becomes comparatively more voluminous and commonly more descending. The spire is variable from almost flat to rather elevated, and also the umbilicus shows some differences. Among lots, which to all appearance, were *Zon. capsellus*, there were examples with a single, sometimes barely perceptible, tooth.

9. With all this, I do not feel positive, at present, that *Zon. andrewsi* W. G. B., and *significans* Bld., are only the juvenile forms of *Zon. placentulus* Shuttl. and *capsellus* Gld. But so much is sure, that they must be desperately similar, respectively, and that they need careful revision, also as to anatomy. The words of W. G. Binney that the latter form "a puzzling group," become of an increased meaning now.

10. For faunistics, it may be of interest that there were a few specimens of *Hyal. ferrea* Mse., from eastern North Carolina, among the materials sent by Mrs. Andrews. In my collection there is one from Randolph Co., West Virginia. Also from different places in eastern Ohio it is known.

New Philadelphia, Ohio, May 1893.

A REVIEW OF VON IHERING'S CLASSIFICATION OF THE UNIONIDÆ AND MUTELIDÆ.

BY CHAS. T. SIMPSON.

Since the theory of evolution has been generally accepted, a complete revolution has taken place in the methods of study and classification among biologists. All artificial systems, or those based upon a single character, have either been relegated to the past or are hopelessly doomed. Students who are progressive and keep abreast of the times, realize that in the study of organic life it is necessary to seize on to every fact which can possibly aid them in classifying: embryology, anatomy, the study of its development in the past as taught by palaeontology, geographical distribution and habits.

Dr. H. von Ihering, of Rio Grande do Sul, Brazil, has recently

published in Archiv für Naturgeschichte,[1] a lengthy article on the *Najidae* of San Paulo, Brazil, and a proposed system of classification in which some startling discoveries are brought to light, and which ranks as one of the ablest papers ever written on the subject. This classification, while working a complete revolution in our preconceived ideas of the relationships of the different members of this group, is so clear and philosophical, it so thoroughly takes cognizance of all the known facts, that it is certainly worthy of the most thoughtful consideration. In a brief review like this I can only allude to the more prominent points, and those who are interested should read the paper itself.

H. and A. Adams, in the Genera of Recent Mollusca, divide the Naiades into two families, *Unionidæ* and *Mutelidæ*,[2] separated by certain minor characters of the shells and animals. Ihering uses the same family names in a somewhat different sense from the Messrs Adams, and unites the whole into a larger group or super-family, which he calls the *Najidæ*. He finds in all the genera which he places in the *Unionidæ*, the larval state is a *glochidium*, that is, a stage or condition in which the animal is completely enclosed in a porous bivalve shell.

On the other hand, the species which he places in *Mutelidæ*, pass through a state after hatching which he calls a *lasidium*, in which the animal is divided into three parts, of which only the middle bears the small, single shell. He finds, on examination, that those South American forms that have hitherto been placed with *Anodon*, pass through the lasidium stage, hence they must be separated from that genus whose larval state is a glochidium, and he retains for this group the name suggested by Gray—Glabaris. He believes that *Aplodon*, having a few South American species, hitherto placed in *Monocondylæa*, and the so-called African Anodons belong to the same family, and that the latter should be placed in *Glabaris*.

D'Orbigny established the genus *Monocondylæa* for certain species of South American *Naiadae* whose shells possess a single cardinal, and no lateral teeth. Several of these will fall into other natural groups. Ihering does not mention the Asiatic species which Lea

[1] Najaden von S. Paulo und die geographische Verbreitung der Süsswasser Faunen von Südamerika, von H. von Jhering. Jahrg 59, 1 Bd., 1 Heft.

[2] Fischer, Manuel de Conchyliologie, p. 997, divides *Unionidæ* into two subfamilies; *Unioninæ* including *Unio*, *Monocondylæa*, *Pseudodon*, *Anodonta*, *Solenaia* and *Mycetopus*; 2d *Mutelinæ*, with *Mutela*, *Hyria*, *Castalia* and *Leila*.

and others have placed in this genus, but I believe they have no close relationship to these South American forms, and that they are merely depauperate Unios, which have a close affinity to species of that genus found with them.

The *Unionidæ* of Europe, North and Central America, and probably of the whole Northern Hemisphere, develop eggs in the outer gills alone as far as is known, with the exception of *Unio multiplicatus* and one or two others, which contain embryos in all four leaves of the branchiae. Ihering states that in all the *Najidae* hitherto examined from South America, the eggs are borne in the inner gills. I may remark in passing that the shells of the Australian, New Zealand, and many South African Unios bear an astonishing resemblance to those of South America in form, texture, smooth epidermis and concentric, sometimes slightly granulated sculpture, and especially in the peculiarly compressed, parallel cardinal teeth, and Suter states[3] that the embryos of *N. menziezi* are borne in the inner gills. Ihering calls attention to the fact that all South American *Unionidæ* have a radial beak sculpture, and suggests that probably the same character may be found in the New Zealand species.

I have carefully examined extensive series of *Unio menziezi* and *lutulentus*, and on the latter find that the umbos are radiately ribbed where the shells are not too badly eroded, and there are traces of such ridges on the former and on some Australian species. He believes that we shall find the beak sculpture one of the best characters for determining the minor divisions of the *Unionidæ*. Notwithstanding the opinion of this eminent conchologist, and the fact that Mr. Wm. A. Marshall, of the New York State Museum, who has also given this subject some very careful study, believes that the beak sculpture is quite constant and may be used in determining species, my own experience in handling great quantities of material from all over the world leads me to consider this a somewhat variable character, and although it will no doubt prove very useful in studying species and the smaller groups, yet I am sure it cannot by any means be always relied on.

It is only in Europe that the post-embryonic larvæ of the *Unionidæ* have been observed actually attached to fishes, though the North American species are known to possess hooks and bristles during this stage, and they no doubt make use of the same means to assist in their distribution, as do their Old World relations.

---

[3] N. Z. Jl. of Science, No. 6, Vol. I (new issue), p. 250.

Ihering fails to find them on any of the South American *Unionidæ* he has examined, but he has probably overlooked the statement of Lea[1] that the glochidium of *Unio firmus* of Brazil is provided with both of these appendages.

Castalia was placed in the *Mutelidæ* by the Messrs Adams, but Ihering shows that it is very closely and curiously related to *Unio*. In the latter the short branchial siphon is open; in the former it is closed; in *Unio* the lateral teeth are either smooth or obliquely striated;[2] in *Castalia* they are vertically ridged. He has applied the name *Castilina* to a few species which stand between the two genera, and has given it generic rank. But he shows that there is a complete intergradation and connection from one end of the chain to the other. In certain Castalias there is a typical animal, in others it is that of *Unio*, and in *Castalina* there is an almost complete blending and crossing of characters. I have noticed on examining large series of these shells that in some Castalias the peculiar tooth sculpture is nearly wanting.

Von Ihering finds that *Unio multistriatus* of Brazil is very closely related to *N. senegalensis* of Africa, and to certain Indian forms. He has, in his collection, a specimen of *Unio radula* of India that is identical with *N. coriaceus* from Rio Janeiro, and believes this fact to be a proof of the long duration of the species of this family and probably evidence in favor of the existence of the lost Atlantis.

His arrangement of the families and genera stands as follows:

Mutelidæ v. Ih. (nec Adams).	*Unionidæ* v. Ih. (nec Ad.).
Leila Gray.	*Hyria* Lam.
Glabaris (Gray) v. Ihering.	*Castalia* Lam.
Aplodon Spix.	*Castalina* v. Ih.
Plagiodon Lea.	*Unio* Retz.
Fossula Lea.	*Margaritana* Schum.
Mycetopus Orb.	*Cristaria* Gld.
Solenaia Con.	*Anodonta* Lam.
Mutela Scop.	
Iridina Lam.	
Pleiodon Con.	
Spatha Lea.	

[1] Observations on the Genus Unio.

[2] In *Unio tortuosus* Lea, a remarkable inequivalve species from China, the laterals have perpendicular striæ, and Lea remarks that if this is found in all the individuals of the species, it would have to be placed in *Castalia*. It has much the appearance of *Unio ellipsis* Lea.

This classification is, to a certain extent, provisional; and may have to be somewhat modified when we have a fuller knowledge of the anatomy. Whatever else may be said of it, the principle adopted is the right one, and the only one which modern science can recognize. The arrangement of the Adams brothers is largely artificial, both as to genera and subgenera, as well as the system adopted by Lea, as they bring together side by side, species and groups from every country which have no close relationship whatever, and by such methods anatomical and conchological characters, the facts of geographical distribution, habits and palæontology, are ignored.

THE SMALL GREY SLUG IN JAMAICA.

BY T. D. A. COCKERELL.

Some days ago Mr. W. Harris sent me from Cinchona some strawberry plants, together with a beetle larva which was injuring them. Of this larva there will be more to say hereafter, but the object of the present note is to record that among the plants I found three specimens of the small, grey slug of Europe, *Agriolimax agrestis*. This slug, well-known as a garden pest in England, has never before been noticed in the West Indies, and there can be no doubt that it has been introduced with plants. It is, I suppose, almost impossible to import living plants without sooner or later introducing foreign slugs. They and their eggs come in the earth about the roots, and, in many cases, it must be practically impossible to detect them on arrival. It might be advisable in some cases to isolate newly-arrived plants by water, and search for slugs on them at intervals; or we might import the carnivorous slug, *Testacella;* or introduce some of our native carnivorous snails, *Oleacina*, into the locality where the plants were being propagated. It has been recorded that in twenty-four hours, 25 specimens of *Testacella* devoured 25 earthworms and 25 *Agriolimax agrestis*.

The small, grey slug, although now first detected here, has spread to many distant localities by human means. I have seen specimens from various parts of the United States, west to the Pacific coast and east to New Jersey, from St. Helena, the Canary Islands, Tristan d'Acunha, New Zealand, etc., and no doubt in time it will inhabit every part of the earth in which the climate is suit-

able to it. In Jamaica it will probably remain confined to the higher altitudes.

Institute of Jamaica, April 13, 1893.

A REPLY TO PROFESSOR WHEELER.

I think that quite enough has been said on the subject of the Unio muddle in the columns of the NAUTILUS, and I do not want to revive the subject. But there are one or two suggestive points in Professor Wheeler's note in the May number that I want to call attention to.

While a Congress of American conchologists might be able to settle certain contested points in nomenclature, if their work did not come into too glaring opposition to certain established laws recognized by scientific societies in general, yet I believe it is impossible for any such body to straighten out the muddle of specific limits, or perhaps, in all cases, the relations of one species to another. I believe that an expert, a specialist who has devoted years to the loving study of a family or genus, is better qualified to judge on these points than any body of students, no matter how capable they may be otherwise, but who probably have only a mere smattering of the matter in question.

C. B. Adams and Dr. Gould ranked easily among the ablest conchologists in the world, but who can doubt that Mr. Lea, or James Lewis were better qualified to judge on the nice distinctions of the Unionidae, or that Dr. Newcomb was more competent to arrange the Achatinellas, or that Dr. Dall has a better knowledge of deep sea Mollusks than did either of these? Because these men have made life studies of these subjects, while the others were not specially interested in them.

A specialist who works on a difficult or puzzling group, goes over his work again and again, putting it aside when he tires of it, and taking it up when the mind is rested. He patiently and lovingly labors over the most minute and obscure points that to most students would be of little or no interest, because his heart is in the work and he is thoroughly determined to master the whole subject. As a rule, his collecting is largely done in the direction of his hobby, and he therefore has more material to work on than one slightly interested. He eagerly reads all literature relating to his work, and in time, if his judgment is well balanced, he becomes an authority.

Now I do not pretend to say that any such person can ever arrive at a point where he never makes mistakes, or where his authority should be taken as absolute, but I do say that he knows at sight and has constantly on his tongue's end much that the ordinary student cannot possibly know or have.

And even when such a specialist publishes the results of his studies they must stand the test of criticism, merciless and searching; they must be subject to all the modifications that will be caused by future discoveries and enlarged knowledge, for it is the naked truth alone that will stand, and not the assertions of any specialist or body of scientists. But I believe that the man who spends years of loving, conscientious labor and study on a subject is better qualified to act as an authority than any body of outsiders.

CHAS. T. SIMPSON.

AMERICAN ASSOCIATION OF CONCHOLOGISTS.

Since the article in the October NAUTILUS, the following have been admitted as members of the Association:

T. S. Oldroyd, 142 N. Los Angelos St., Los Angelo, Cal. Subject—(not chosen yet).

Wm. H. Myles, 53 Arkledun Ave., Hamilton, Ontario, Canada. Subject—Helicidae and Pupidae of Ontario.

A. H. Gardner, P. O. Box 84, Fort Hamilton, Long Island, N. Y. Subject—Land Shells and Fresh-water Univalves of the United States.

Miss S. P. Monks, 305 Bunkerhill Ave., Los Angelos, Cal. Subject—(not chosen yet).

A. G. Wetherby, Magnetic City, Mitchell Co., N. C. Subject—(not chosen yet).

Chas. S. Hodgson, Albion, Ill. Subject—Helicidae.

W. H. Conrad, 11 Bank St., Philadelphia, Pa. Subject—Tertiary Shells.

M. J. Elrod, Wesleyan University, Bloomington, Ill. Subject—(not chosen yet).

Geo. H. Clapp, 116 Water St., Pittsburgh, Pa. Subject—Helicidae.

Members will please note the following changes of addresses since the publication of the list of members:

John Ford, Holmes Station (B. & O. R. R.), Delaware Co., Pa.
Mrs. E. P. Gaylord, 167 E. Congress St., Detroit, Mich.
L'abbé P. A. Begin, Seminare St., Charles Borromee, Sherbrooke, Quebec, Canada.
Frank J. Ford, 314 Wabash Ave., Wichita, Kan.
R. T. Shepherd, 110 N. Market St., Troy, Ohio.
Dr. W. S. Strode, Lewiston, Ill.
T. Wayland Vaughan, 6 Brewster St., Cambridge, Mass.
John Watson, 6 Garson St., Rochester, N. Y.
Jas. H. Lemon, Avonmore P. O., Ontario, Canada.
Mrs. S. H. Young, 423 Second St., Cedar Falls, Iowa.
Chas. Le Roy Wheeler, Damascus, Wayne Co., Pa.
Robt. Walton, Houghton St., Lower Roxborough, Phila., Pa.
E. H. White, 1202 Thomas St,, Rockford Ill.
Dr. C. F. Newcombe, 70 Dallas Road, Victoria, B. C.
Rev. A. Dean, Fort Lee, N. J.
R. C. Barnard, 21 Park Row, New York City.
Berlin H. Wright, Penn Yan, N. Y.
A. Schlehenried, 16 N. William St., New York City.
John H. Campbell, 1009 Walnut St., Phila., Pa.
Robt. T. Jackson, 33 Gloucester St., Boston, Mass.

NOTES AND NEWS.

Mr. Hugh Fulton, of London, passed through Philadelphia, recently, en route for Chicago. His stay, though short, was most enjoyable.

Note.—Owing to the expected absence from Philadelphia of the Editors and Manager, the July issue of the Nautilus will probably be delayed beyond the usual time.

Last week a coyote was found at Punta Banda, San Diego county, trapped by an abalone shell [*Haliotis cracherodii*]. The coyote had evidently been hunting for a fish breakfast, and finding the abalone only partially clinging to the rock had inserted his muzzle underneath to detach him, but the abalone closed down on him and kept him a prisoner.—*Weekly Bulletin*, San Francisco, May 17.

THE NAUTILUS.

VOL. VII. JULY, 1893. No. 3

TO CONCHOLOGISTS.

The Editors of the NAUTILUS would like to impress upon American Conchologists that they are not conducting this paper for their personal aggrandizement, as some persons seem to believe. The work done has been purely a labor of love, for the promotion of interest in conchology; and the Editors have not only put much work into the enterprise, but, from first to last, a considerable number of large and shining Dollars, and this without expectation of pecuniary return.

We have looked forward to the unanimous support and encouragement of American Conchologists, for it is only by such support that a paper of this character can be sustained. We know that there are enough persons in the States interested in Conchology to give this support, and to enable us to increase the size, the number of illustrations and the interest of the articles as well.

We depend upon YOU to aid us in bearing the expenses of publication. We depend upon YOU to send us notes and matter to increase the interest and usefulness of the numbers from month to month. The time we put on this work is time stolen from scientific work of vastly greater magnitude, and it is only by the liberality of the Academy of Natural Sciences and the Wagner Institute that we are enabled to give the attention necessary to conduct a monthly journal.

We write thus because we know that we are not having the sup-

port we deserve from American Conchologists. Scores of subscriptions remain unpaid, and requests by letter to "square up" are calmly ignored.

We would ask our subscribers in all seriousness, Do you need this paper? If so, why not support it. We depend upon the Conchologists of America to help and encourage us in making our NAUTILUS a journal worthy of American Science.

H. A. P. & C. W. J.

BULIMULUS PROTEUS Broderip AND ITS DISTRIBUTION.

BY W. H. DALL.

Bulimus proteus was described by Broderip from Peru in 1832. It was referred by Deshayes to *B. sordidus* of Lesson, an opinion not generally adopted, and which he afterward relinquished. In 1860, Mr. J. Xantus, collecting for the Smithsonian Institution at Cape St. Lucas, obtained one adult and two young specimens of a large *Bulimulus*, which were referred to Broderip's species by Binney; an opinion which was justified by the close resemblance and small amount of material for comparison. The singularity of distribution has been commented on by every one from Binney to Crosse and Fischer in their magnificent work on the Mexican land shells, and Dr. Cooper in recent papers on Lower Californian land shells. By a recent expedition of the California Academy of Sciences to Lower California, nearly 100 specimens of the shell in question were obtained, which I examined while in California in 1892, and which are described by Dr. Cooper (Proc. Cal. Acad., 2d Ser. III, p. 211, 1892), thus for the first time giving an opportunity for careful comparison of our Californian species with that from Peru. A series kindly sent by Dr. Cooper on behalf of the Academy, together with the original specimens of Xantus and a series of fourteen specimens of the Peruvian *B. proteus*, have been critically compared, leaving no doubt, in spite of the close similarity, that the Mexican shell is distinct and must receive a name, as the synonyms are all strictly referable to the Peruvian form.

Bulimulus (Scutalus) montezuma Dall.

B. (S.) proteus Binney, L. & F. W. Shells N. Am., 1, p. 207, fig. 358, 1869; not of Broderip, P. Z. S., 1832, p. 107.

Habitat, Lower California, mostly from the mountainous region (3500 ft. alt.), Eisen, Belding and Xantus.

As Dr. Cooper observed, this species is not as "protean" as some others. It exhibits no such variations in form or color as *B. proteus;* the latter assumes almost every mutation of form, but taken on the average is less acute and has the last whorl less patulously drawn out, axially, than the *B. montezuma*. The color of *B. proteus* is variably distributed, but tends in the most strongly colored examples to be laid on in 4–6 broad, spiral bands of brown, with indistinct boundaries, separated by paler zones. In *B. montezuma* the color is seldom present, but, when it is, it is laid on in narrow, obscure zones, parallel with the incremental lines and never spirally disposed. The granulation in the Californian shell is less coarse and intense than in the Peruvian species when most developed, and the umbilicus averages much smaller in the former. All these characters are of degree rather than kind, but two features may be mentioned which appear constant and specific. In the Mexican shell the angle which the outer lip makes with the body whorl, or axial perpendicular, at its junction is invariably more acute than in *B. proteus*, which latter has the lip bent suddenly down at this point. Secondly, the larval shell or nucleus of *B. proteus* is beautifully shagreened with minute punctations or short, almost vermicular, indentations, visible plainly under a glass, and only absent when worn off by abrasion. Traces of this sculpture may always be found. In *B. montezuma* the nucleus is delicately ribbed in harmony with the incremental lines, and does not show the peculiar shagreening alluded to, a character which alone is sufficient to establish its distinctness, but the constancy of which could not be predicated from the three specimens examined by Mr. Binney.

The distribution of the species now determined by Messrs Eisen and Belding is sufficient to disprove the hypothesis of introduction by artificial means, and it is satisfactory to have our largest North American species placed upon a permanent footing.

EDIBLE MOLLUSKS OF SOUTHERN CALIFORNIA.

BY MRS. M. BURTON WILLIAMSON, UNIVERSITY, LOS ANGELES CO., CAL.

In an interesting article upon the "Edible Mollusks of Rhode Island," by Mr. Horace F. Carpenter, published in the NAUTILUS some time ago, he compares the number of marine edible mollusks of Rhode Island with those reported from San Francisco by Professor Keep.

Without wishing to leave the impression that California can compete with Rhode Island in the number of species found in the "fish markets," yet the number recently reported from this State can be greatly increased. The number of shells offered for sale here is always limited, and the famous "clam-bake" of the eastern shore is never duplicated. In the Los Angeles fish markets, *Donax* and *Chione* are the most abundant.

Donax californicus Conr. is the favorite clam for soup. This tiny bivalve might seem to an observer "all shell," yet it proves a very good substitute for the oyster in soup. The shells are carefully washed, allowed to remain in fresh water some hours, boiled, then drained. The liquid drained off is, with plenty of milk added, converted into a very palatable soup, especially when one is on the beach, and has just returned to the tent after a good bath in the ocean.

Chione simillima Sby. is often offered for sale at five cents a pound. *Chione fluctifraga* Sby. and *Chione succincta* Val. are occasionally found with the former, as they are collected from the same mud flats. Soup made from this shell-fish is not finely flavored and the meat is tough.

Tivela crassatelloides Conr., large shells are sometimes sold in the markets, usually at five cents each. *Tapes staminea* Com., *Ostrea lurida* Cpr., *Ostrea virginica* Gmel. (the latter brought here from San Francisco), *Mytilus californianus* Conr., *Mytilus edulis* Linn., and *Pecten aequisulcatus* Cpr., are also occasionally offered for sale, but in limited quantities. *Haliotis cracherodii* Leach may sometimes be seen in the market, although I have not seen one this winter. Occasionally a small *Haliotis fulgens* Phil. has been seen with the former species. The Mexicans seem to be fond of this shell-fish, as I have seen three and four dozen Halioti dried and strung on a cord, the same as they string red-peppers. When dried, the Abalones, as they are named by the Mexicans, look like oblong pieces of very thick leather, more than anything else that I can describe.

The number of species found in Los Angeles city markets, and not reported from San Francisco, would, I believe, add six more to the Californian region. Professor Keep says the *Mytilus californianus* is found outside of San Francisco Bay, but does not mention it as sold in the city. *Amiantis callosa* Conr. is occasionally eaten when collected in San Pedro Bay, although I have been told it was "not a very tempting dish." As it does not live near the shore,

collectors do not often find more than single valves on the beach.

In the "Catalogue of Economic Mollusks," written by Lieutenant Francis Winslow, upon the exhibition of the U. S. Nat. Museum, at the "International Fisheries Exhibition," at London, in 1883, he says of *Macoma nasuta* Conr., "It is abundant in San Francisco Bay, and it was evidently eaten largely by aborigines, as the shell-mounds in the vicinity of the bay are largely composed of shells of this species." I have not heard of this shell-fish being eaten here, nor the much larger *Macoma secta* Conr., but Lieutenant Winslow says the former is "eaten on the Pacific coast by all classes." The same writer mentions *Platyodon cancellatus* Conr. as existing in "great abundance in Bolinas Bay and Santa Barbara. Its habits are essentially those of the 'soft clam,' and it forms one of the staple food shell-fish of the Pacific coast," although Mr. C. R. Orcutt, in his "Notes on the Mollusks of San Diego," says this shell has been collected for food at La Playa, "but the animal is bitter." I fear I am digressing, as Professor Keep's article was intended by him as the first of a series of articles reporting "food mollusks which may be bought in the markets of our country," each writer "reporting for his (or her?) own locality."

Notwithstanding the number of species we can report from California, I am compelled to admit that, in quality and number of individuals, California cannot boast of her edible mollusks.

ON A NEW SPECIES OF YOLDIA FROM CALIFORNIA.

BY W. H. DALL.

Yoldia montereyensis n. s.

Shell large, stout, inflated, with a polished, dark greenish olive epidermis; beaks eroded in all the specimens, situated in the anterior part of the middle third of the shell, not prominent; valves full and rounded, anterior end evenly rounded into the upper and basal margins; posterior end narrower, rounded, the extreme end nearer the cardinal margin with which it almost forms an angle, below sloping obliquely toward the basal margin, with a very obscure broad ray impressed in a radiating manner from the beaks toward the oblique slope, the profile of which it does not perceptibly indent; surface sculptured only by feeble incremental lines; epidermis polished with one or two darker concentric color zones and a microscopic, irregular, radially disposed wrinkling, most con-

spicuous at the margins of the impressed ray; posterior cardinal margin nearly straight, anterior ditto evenly rounded; interior porcellanous white, the pallial sinus not reaching the middle vertical line of the shell, broad and rather rounded; ligamental fosset large, cuplike; anterior teeth V-shaped, about 22 in number, strong and prominent; posterior teeth similar, and forming an equally long line but only 18 in number, the posterior cardinal margin showing a long narrow impressed area very feebly marked; length of shell 32; beak from anterior end 12; vertical from beak to base 17; max. diameter 13 mm.

Habitat U. S. Fish Com. Station, 3202, in 382 fathoms green mud, Monterey Bay, California, bottom temperature, 41° Fahrenheit.

This fine shell recalls *Y. thraciæformis*, but is smaller, without the angularity of that species and proportionately more solid. It was dredged by the U. S. Steamer Albatross, several years ago. It is probably a deep water species exclusively at least in the latitude of California. The types are in the U. S. Nat. Museum, 106,972.

NOTES ON THE GENERA OF UNIONIDÆ AND MUTELIDÆ.

BY H. A. PILSBRY.

In the June number, p. 20, a list of the genera of *Unionidæ* and *Mutelidæ* recognized by Dr. v. Ihering is given. It should be noted that by inadvertence *Pleiodon* Conr. is given as a genus, but Ihering considers it a synonym of *Iridina*. The genus *Pseudodon* Gld. was omitted after *Cristaria* Schum.[1]

Attention should also be directed to the fact that the name *Castalia* Lam., 1819, is preoccupied in Vermes by Savigny, 1817 (Système des Annelides). Probably TETRAPLODON Spix, 1827 can be used in this case as a substitute.

For *Aplodon* Spix (preoc. by Rafinesque in Pulmonata), may be substituted SPIXOCONCHA.

Lea's name *Plagiodon* (1856) seems also to be preoccupied (by Dumeril in Reptilia, 1853), and the group may therefore be called IHERINGELLA, Lea's species *isocardioides* being the type.

---

[1] The Editor fears that these errors may have been due to his own hasty proofreading, rather than to defects in the original MS.

NOTES ON THE ACANTHOCHITIDÆ WITH DESCRIPTIONS OF NEW AMERICAN SPECIES.

BY HENRY A. PILSBRY.

The family Acanthochitidæ includes Chitons having the exposed surface of the valves, when present, divided into a narrow dorsal smooth or striated band, sometimes obsolete, with a granular area on each side, formed by the union of the lateral areas and the plural tracts of the central areas. The *Cryptoplacidæ* also share this peculiar plan of valve-sculpture, but they are vermiform in shape and not nearly covered above by the valves, whilst the *Acanthochitidæ* have well-developed valves covering the upper surface, even in those genera like *Amicula* and *Cryptochiton* which have the girdle-skin extending over the larger part or the whole of the dorsal armor. There are many other differences, but still the *Cryptoplacidæ* give unmistakable evidence of their descent from *Acanthochitidæ*. On the other hand, all other Chitons differ in having the valves divided into triangular lateral, and wide central areas, and in other equally important if less obvious features.

The following genera belong to Acanthochitidæ: *Spongiochiton*, *Leptoplax*, *Acanthochites*, *Katharina*, *Amicula*, *Cryptochiton*. All but the first two are found upon the United States coasts. It will be noticed that the association of *Acanthochites* with *Mopalia*, instituted by Dr. Philip Carpenter, is not retained.

Some naturalists may find it difficult to believe that complex structures so very similar to each other as are the posterior valves in *Mopalia* and *Acanthochites* could have arisen independently; but that this is the fact I feel entirely assured. In the two cases, this peculiar form of two-slit and sinused posterior insertion-plate, arose from a perfectly regular, even, and many-slit plate; the two phyla travelling along parallel roads. The Mopaloids reach their culmination in *Plaxiphora*, which has lost its two posterior slits, and is in this respect quite analogous to an old individual of *Cryptochiton stelleri*.

The genus *Acanthochites*, which has given its name to the family, is readily recognized by the series of tufts of fine bristles, like spun-glass, along each side. These tufts may be accounted for by the theory that they are the result of over-nutrition caused by the frequent flexure of the girdle at the sutures; this flexure naturally bringing a greater share of nutriment to the stimulated point than

to the comparatively motionless portion at the sides of each valve, resulting in a more exuberant growth of girdle spicules there.

Within the *Acanthochites* stock the progressive diminution of the tegmentum or outer layer of shell, has proceeded along two lines: in one series of forms the girdle has encroached at the sutures, producing a heart-shaped exposed area, seen in such species as the *Notoplaces*, and this system has also produced the Amiculas. In the others, the tendency has been to encroach along the sides of the valves, leaving a narrow or linear tract, resulting in forms like *Acanthochites exquisitus*, and culminating in *Cryptoconchus* (*C. monticularis* Q., and *floridanus* Dall.)

Acanthochites is divisible into four sections: *Acanthochites* typical, having a wide caudal sinus and two slits in the tail valve, and well-developed sutural tufts; *Notoplax*, having several slits in the tail-valve behind, and the girdle encroaching at the sutures; *Cryptoconchus*, having a similar tail-valve, but the girdle encroaches at the sides, leaving only a linear dorsal area exposed; and finally, *Loboplax* (sect. nov.), with a many-slit tail-valve, the head valve strongly 5-lobed and ribbed, girdle nearly naked—type *A. violaceus* Quoy. The following two species belong to the typical section:

A. exquisitus n. sp. Visible portions of the valves extremely narrow, generally less than one-fourth the entire width of the dried animal. Valves dark olive, interior blue; the girdle light green, tufts very large, either green, pink or bronze; fleshy covered with a green pubescence. Length 30, breadth 18 mill. La Paz (Lockington).

The valves are more covered than in any other form, the tegmentum being far less in area than one of the sutural laminæ.

A. rhodeus n. sp. Exposed portion of valves subtriangular, about one-third the entire width, the valves depressed, obtusely carinated, brown, almost separated by the encroachment of the girdle at the sutures. Median area smooth, not striated. Interior deep rose colored. Length 28, breadth 15 mill. Panama (MacNeil).

A. (*Notoplax*) *hemphilli* n. sp. Valves heart-shaped, about one-third the total width; red, more or less maculated with white; girdle rust-brown; dorsal area having some longitudinal striæ. Interior light green at the sides, deep rose-red in the middle. Girdle wide, sparsely clothed with microscopic hyaline spicules, having a marginal row of longer spicules and 18 small white tufts. Length 24, breadth 11 mill. Key West, Florida (Hemphill).

MOLLUSCA OF ARKANSAS.

BY F. A. SAMPSON, SEDALIA, MO.

A report on the shells of Arkansas, made to the State Geologist of that State, will soon be published, and in this paper I will give the list of species, not including the Unionidæ. I have collected in twenty-five counties, but not equally in all—in some having made search in many different places and at different times, and in others in only one place or at one time.

The type specimens of those species marked * were from Arkansas.

Selenites concava Say.
Limax campestris Binn.
Zonites friabilis W. G. B.
Z. lævigatus Pfeif. (Binney's Manual).
Z. demissus Binn.
Z. brittsi Pils.*
Z. ligerus Say.
Z. arboreus Say.
Z. viridulus Mke.
Z. indentatus Say.
Z. minusculus Binn.
Z. placentulus Shuttl. (Binney's Manual).
Z. fulvus Drap.
Z. undetermined.
Z. undetermined.
Z. gularis Say.
Tebennophorus carolinensis Bosc.
Patula solitaria Say.
P. alternata Say.
P. perspectiva Say.
Helicodiscus lineatus Say.
Strobila labyrinthica Say.
Polygyra texasiana Mor.
P. triodontoides Bland.
P. jacksoni Bland.
P. dorfeuilliana Lea.
P. dorfeuilliana sampsoni Weth.*
M. divestus Gld.
M. elevatus Say.
M. exoletus Binn.
M. exoletus minor.
M. thyroides Say.
M. thyroides bucculentus Gld.
M. clausus Say.
M. kiowaensis arkansensis Pils.*
Dorcasia berlandieriana Mor. (Binney's Manual).
Bulimulus dealbatus Say.
Pupa fallax Say.
P. armifera Say.
P. contracta Say.
P. procera Gld.
Succinea ovalis Gld.
S. ovara Say.
S. obliqua Say (Binney's Manual).
Helicina orbiculata Say.
Limnæa humilis Say.
L. columella Say.
L. catascopium Say.
Physa gyrina Say.
P. heterostrophe Say.
Planorbis trivolvis Say.
P. bicarinatus Say.
Ancylus tardus Say.
Vivipara contectoides W. G. B.

P. leporina Gld.
Stenotrema labrosum Bland.
S. edgarianum Lea (Binney's Manual.)
S. stenotremum Fer.
S. monodon fraterna Say.
S. leaii Ward.
Triodopsis obstricta Say.
T. appressa Say.
T. inflecta Say.
T. edentata Sampson.*
T. fallax minor Weth.*
T. vultuosa Gld.
Mesodon albolabris Say.
M. albolabris minor.
M. albolabris alleni Weth.*
V. subpurpurea Say.
Campeloma subsolidum Anth.
C. ponderosum Say.
Pomatiopsis lapidaria Say.
Pleurocera subulare Lea.
P. canaliculatum Say.
Goniobasis lawrencei Lea.*
G. plebeius Anth.
G. cubicoides Anth.
G. crandalli Pils.
Sphærium sulcatum Lam.
S. striatinum Lam.
S. stamineum Conr. (Prime).
S. transversum Say (Prime).
Pisidium abditum Hald.
P. virginicum Bourg.

One unnamed Zonites bears considerable resemblance to *Z. limatulus*, but is of only three mm. diameter, more depressed, sutures less impressed and outer whorl more rounded, and having four whorls.

The other unnamed one has the general size and appearance of *Z. arboreus*, but has six whorls. These were both found on the Boston Mountains. *Zonites brittsi* was described in the NAUTILUS of last January. The type specimens were collected by Mr. R. A. Blair, of Sedalia, in Garland County near Hot Springs. They are very close to *Z. demissus*.

Patulu solitaria has not before been recorded from as far south. Very few specimens of *Polygyra texasiana* were found in the State, but they were very abundant in the Indian Territory across the river from Fort Smith. In no county except Garland were both *dorfeuilliana* and its variety *sampsoni* found. The latter was most abundant in Carroll County, fifteen or twenty being frequently under one stone. *P. jacksoni* was much larger than typical size on the bluffs at Van Buren. But one *T. obstricta* was found, and that a dead one, near Batesville. *T. edentata* were collected on the Boston Mountains in Franklin County. They are larger than *inflecta* and almost or entirely without teeth on the peristome. *T. fallax*, from the northwest corner of the State, were quite small, and many of them albinos.

The *Mesodon albolabris*, from Eureka Springs, are pronounced by Wetherby to be a very distinct variety. He has also described the two other varieties from the same place, and the *exoletus minor* from there are said by Mr. Binney to be "very curious."

The *kiowaensis* variety, *arkansensis*, lately described in the NAUTILUS, were collected by Mr. R. A. Blair, near Hot Springs.

The *Goniobases* were generally very plenty where found at all, and in other streams near by there were none. I have them from many streams. The *G. crandalli* was collected at Mammoth Spring, and described in the Proceedings of the Philadelphia Academy of Sciences.

NOTE ON ENDODONTA (Flammulina) INFUNDIBULUM Hombr. & Jacq.

BY CHARLES HEDLEY, AUSTRALIAN MUSEUM, SIDNEY, N. S. WALES.

In the "Reference List of the Land and Fresh-water Mollusca of New Zealand" by Mr. H. Suter and myself, the species named above was placed under *Flammulina crebriflammis* Pfr. as a synonym. Tryon and Pfeiffer, whom we followed in this course, were certainly wrong in connecting *infundibulum* with *crebriflammis* (Mon. Hel. Viv. iii, p. 148, etc.). *H. infundibulum* was described from Vavas, Tonga Is., and appears to be a small variety of *Gradata* Gould. It was omitted from Mousson's Tongan list.

NOTES AND NEWS.

REV. DR. A. DEAN has removed from Muncy, Pa., to Fort Lee, N. J., on the Hudson, above New York City. The best wishes of many brother Conchologists go with him to his new home on the Palisades.

AN interesting paper on the shells collected by the Death Valley Expedition, by Dr. R. E. C. Stearns, has appeared in the "North American Fauna" series, published by the U. S. Dept. of Agriculture. Some pages are given to the discussion of the Tryonias, which were collected alive by Dr. Merriam in a hot spring in Pahranagat Valley, Nevada. The "*Tryonia*" *protea* is shown to intergrade perfectly with the smooth form which Frauenfeld called *Hydrobia seemani*. It is a species of *Bythinella*. Stearns retains *Tryonia clathrata* distinct, as he has seen no examples connecting with *protea*. Several species of Amnicolidæ are described and figured, and valu-

able data on the south-eastward distribution of *Arionta* are presented.

Dr. H. von Ihering has been appointed Director of the Zoological Department of the Museum at San Paulo, Brazil.

In electing officers of the American Association of Conchologists for the ensuing year, John H. Campbell was elected President; John Ford, Vice-President; Chas. W. Johnson, Secretary.

The death of the well-known Zoologist, Carl Semper, of Würtzburg, Germany, on the 29th of May, has been announced.

Willard M. Wood, of San Francisco, intends very soon to make an eastern trip, visiting Chicago, New York, Philadelphia and Washington.

Mr. H. E. Sargent, formerly of Woodville, Alabama, is in Philadelphia, where he proposes to spend some time in biological work.

A "Reference List of the Land and Fresh Water Mollusca of New Zealand" has been published by Messrs Chas. Hedley of Sydney, N. S. Wales, and H. Suter of Christchurch, New Zealand. It forms an extremely useful index to that fauna, and is indispensable to those who desire to understand the peculiar genera of Australasia.

EXCHANGES.

Wanted, about 25 specimens of any one species of *Dentalium*; also live specimen of *Zonites elliotti, demissus, intertextus, gularis, internus* and *nitidus*. Offered, British L. and Fr. W. and North American L. and Fr. W. shells, also dart of *Zonites ligerus* Say.—Robert Walton, Houghton street, Lower Roxborough, Philadelphia, Pa.

M. M. Schepman, Rhoon, near Rotterdam, Holland, has, to exchange, many East Indian sea shells. Send list and receive mine.

For exchange, 200 species of land and fresh water shells, from British India, Burmah and Ceylon; also large collection of marine shells from various parts. Offers solicited in land and fresh water shells.—Miss J. E. Linter, Arragon Close, Twickenham, England.

THE NAUTILUS.

VOL. VII. AUGUST, 1893. No. 4

NOTICE OF NEW CRETACEOUS FOSSILS FROM THE LOWER GREEN MARLS OF NEW JERSEY.[1]

BY R. P. WHITFIELD, AMERICAN MUSEUM OF NATURAL HISTORY, NEW YORK CITY.

Mr. Pilsbry recently sent me a few New Jersey fossils for identification; among them were the following new species which he wished me to describe for the NAUTILUS.

Volutoderma Woolmani n. sp.

Shell, as shown by the internal cast, somewhat more than an inch in length, and having a diameter of the body volution of seven-sixteenth of an inch in the cast, being more slender than any species yet described. Volutions largest just below the suture and attenuate below, forming a moderately long beak; marked in the upper part by eight comparatively strong vertical plications, which are obsolete below. Columella marked by three very distinct folds or ridges, the lowest of which is the strongest. These are well marked on the inside of the upper volutions.

This species like most of those from the New Jersey Green Marls is known only from an internal cast. It retains only two volutions and is imperfect at the base of the beak. It is very distinct, how-

[1] Illustrations of the following species will be given next month.

ever from any species previously noticed, being much smaller and of more slender habit. The external markings are unknown. The specimen is from the Lower Green Marls at Lenola Station on the Long Branch Division, Pennsylvania Railroad in Burlington Co., New Jersey. The type is in the collection of the Academy of Natural Sciences of Philadelphia. Collected by Mr. Lewis Woolman of Philadelphia for whom it is named.

Cerithium Pilsbryi n. sp.

Shell elongated and slender; volutions numerous, number not determined, very gradually expanding with additional growth; apex and aperture unknown. Volutions slightly convex between sutures, and ornamented by a band of small oblique nodes immediately below the suture; also by a series of larger vertical folds which extend across the exposed part of the volution, below the upper band of nodes, and numbering something more than one half as many to the volution as the nodes above. There are also very fine spiral striæ almost too fine be seen without magnifying. The lines of growth are fine but distinct, and take a broad sweeping backward curve between sutures. Apical angle fifteen to eighteen degrees.

This species is a new type for the New Jersey cretaceous, and I know of none of the same type in the rocks of this age in North America; while in the Cretaceous of Palestine there are several species already described. The one most nearly like this being that described in the Bulletin Am. Mus. Nat. Hist. for December, 1891, figured on Pl. IX of Vol. III, figs. 11 and 12, under the name *Cerithium Conradi;* the point of difference between them being the exact reversal of the lines of nodes, the upper one here being small while on that one it is the largest. These specimens consist of concretionary matrices, in what appear to have been Coprolitic bodies, in one of which there are fragments of several species of molluscs represented. They are also from the Lower Green Marls at Lenola, N. J. Collected by Mr. Lewis Woolman, and are deposited in the collection of the Academy of Natural Sciences, Philadelphia.

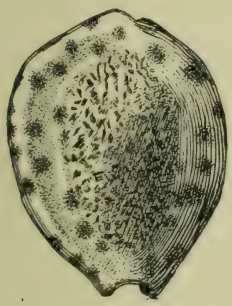
Another Cerithium-like shell occurs with the above, but is too imperfect for specific description. It presents characters which would most likely ally it to *Cerithiopsis.* There are imprints of portions of six volutions remaining in the matrix showing three lines of nodes on each volution, increasing in size from above downward. This also is an undescribed species. There is also an internal cast of a species of *Anchura* or *Rostellaria,* which differs from any

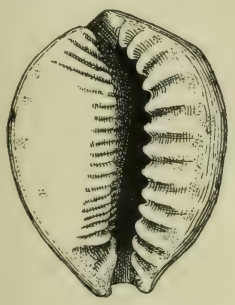
described form, but too imperfect for characterization. Mr. Woolman writes me that the locality from which these specimens were obtained has yielded upward of sixty species of Molluscan remains, which is rather more than that obtained from any one locality within the State, from this bed, so far as I know.

DESCRIPTION OF A NEW SPECIES OF CYPRÆA.

BY JOHN FORD.

In the description of *Cyprœa cruenta* Gmel. var. *Greegori* Ford, published in the NAUTILUS for Feb., 1893, it was suggested that most conchological students would probaby have made *Greegori* a species instead of a variety. It may at once be said that the writer of that description is now fully convinced of the specific distinction of the latter, and has therefore decided to alter the name from *C. cruenta Greegori* Ford to *C. Greegori* Ford. Under the circumstances such a





change will doubtless meet with some opposition. Nevertheless, I have no hesitation in making it, inasmuch as my conclusions are chiefly based upon the careful study of some fifty specimens secured by me since the description referred to was written.

These are of various sizes and stages of growth, yet all of them can be readily separated from any other species belonging to the genus, though in exceptional instances the heavy callus on the sides and ends is creamy white and the typical blotches scarcely discernable. The larger portion of my former description may be profitably retained, but as it is desirable to make a few additions it is reproduced here with these included.

Cypræa Greegori Ford, n. sp.

Shell depressed, orbicular oval in form, callus on the sides and ends remarkably thickened. That on the sides light salmon in color, with irregular purple-brown spots, having a blotchy appearance. Dorsal surface similar to that of *cruenta*, but lacking the whitish spots typically present in that species. Base semi-translucent, spotless, dark buff or salmon colored, darkest in the interstices. Teeth on outer lip very strong, long and whitish; on inner lip finer, with exception of the anterior fold and one or two adjacent teeth, the first of these latter being very prominent and notably transverse. Space between the anterior fold and the following tooth wide and brightened; posterior teeth of inner lip prolonged outward upon the base. Dimensions of average specimen: length $1\frac{1}{4}$, breadth $\frac{7}{8}$ inch.

That *C. Greegori* is more nearly related to *C. cruenta* than to any other species, I have no doubt. But it is equally true that the former possesses several characters altogether distinct from those belonging to the latter. For instance, *C. greegori* is more translucent, more rugged, much smaller and rounder in form, different in general color, and in the peculiar variations of the teeth, also in the remarkable thickness and brilliancy of the callus with which it is rimmed.

With the probable exception of one poor specimen, this shell was unknown to the late Mr. Tryon, and for the same reason, perhaps, it was not noticed in Mr. Robert's catalogue of the species. Nevertheless, an excellent figure of it was published by Kiener[1] who merely referred to it as a variety of *C. cruenta* (variolaria). A figure, *possibly* intended for the same shell, was also published by Sowerby[2] who seems to have considered it a variety of *C. caurica*. More recently, Sowerby's figures were alluded to by Mr. J. C. Melvill[3], as the var. *coloba*, but whether this variety was referable to *C. cruenta* or *C. caurica*, seems to have been a question that he was either unable or unwilling to decide. At least, in one sentence he apparently makes *C. cruenta* responsible for its parentage, while in another sentence the same honor is given to *C. caurica*. Verily it seems that even the babes in "Pinafore" could not have been more hopelessly mixed than were these poor little waifs.

---

[1] Iconographie Coquilles Vivantes, Page 57, pl. 27, fig. 3.

[2] Thesaurus Conchyliorum. Plate 23, fig. 190.

[3] 1st Vol. 4th series of Memoirs and Proc. of the Manchester, (Engd.) Lit. and Phil. Society, 1887--8.

So far as I am aware, no description of the shell, previous to my own, has been published; and unless proof of such publication is shown I shall claim priority both for the name and description. This claim has especial reference to a criticism of the name applied to the shell in my former article.

It might be well to add that the incipient tooth in the interstice next to the anterior fold, as shown in the figure published in THE NAUTILUS for April, 1893—is not typical, since it is discernable in less than five per cent of the specimens, and very slightly in them. In a hurried selection of the specimen for drawing purposes, this very minute protuberance was unobserved by me. Otherwise it would not have been drawn. This error has been corrected in the figure accompanying this article.

BEACH SHELL COLLECTING IN CONNECTION WITH A STUDY OF OCEANIC PHENOMENA.

BY MRS. M. BURTON WILLIAMSON.

It has often occurred to me that a shell collector who is something of a physicist, having a love for historical facts, could furnish interesting data in regard to shore collecting under certain physical conditions of the ocean. Few amateur collectors note the historical, or rather chronological appearance of genera and species collected by them, they are usually satisfied with obtaining a "good find," but time and seasons are hardly observed, certainly not studied as furnishing data for future reference. A storm is hailed as a precursor of "rare finds," but a study of the storm with notes in regard to it, accompanied with a list of shells found after such a storm are too frequently neglected by collectors. Mollusks are collected too often as a miser collects his money, *as a mania,* not as a medium for an intelligent study of Nature. It seems to me, that a study of mollusks thrown upon the shore from other areas, in connection with a study of the physical condition of the ocean at such times, would be very helpful to the collector, although of no value to science. It may be urged that shells cast up by the sea are merely "happen-

ings" and no data can be gathered in reference to what seems a work of chance. When a heavy gale ploughs up the home of mollusks and huge breakers land them, by the incoming tide, on the shore, no collector can fore-tell when such a phenomenon may occur, nor what conchological rarities may follow in the wake of such a storm. Rare shells are sometimes washed ashore, then years may elapse before they again make their appearance. Sometimes shells considered as belonging to the fauna of a different latitude are found among the drift in such small numbers as to raise a question as to their introduction by artificial means. During a violent storm mollusks travel great distances before they are cast upon the shore. This is especially noticeable in pelagic organisms which are often cast upon the beach when some ocean current buoys them inward toward the shore. All these facts combine to make it impossible to collect *working* data, but one cannot doubt that a study of collections as the result of unusual conditions of Neptune might be conducted with some satisfactory results. A diary of the atmosphere, tides, daily physical conditions of the ocean with lists of shells found during the same period, if followed any length of time, might be resultant in adding a few facts that would be interesting, even though not very valuable. High and low tides would influence "finds" at any time, but some "low tides" are much richer in molluscan forms than others.

As a rule each region has its own fauna; when this fauna is disturbed and carried outside the range of its own normal environment it must be due to unusual conditions in the surrounding water; shells from the laminarian and inner corallines zones found strewn upon the beach are the *effect* of some *cause*. To a physicist, a study of the storm that stranded rare forms upon the beach, would surely be as interesting and important as the shells found in the drift! The study of oceanic phenomena in connection with conchological acquisitions might be valuable to the collector in many ways; although of no value to the scientific world in these days of applied science, with hydrographers collecting data, and with all the modern appliances furnished to ships sent out on scientific explorations.

We narrow our horizon by failing to observe and study that which is near at hand. There are environments that afford more than ordinary facilities for study, but only a few are so favored, and only a small proportion of these utilize their opportunities.

NOTES ON THE NORTH AMERICAN SPECIES OF SUCCINEA.

BY T. D. A. COCKERELL.

[*Concluded from Vol. VI, p.* 31.]

(18.) *S. luteola* Gould. Mr. Singley sent me this from Manatee Co., Florida, and at the same time specimens marked *texasiana* Pfr., from Derby, Frio Co., Texas. I made notes on these shells as follows:

(a.) *S. texasiana.* Belongs perhaps to *putris* group, but very different from it, and forming a new subsection. Shell shaped, but for mouth, like some varieties of *Limnæa palustris.* Length 16½ mill. Transversely irregularly striate-ribbed. Young example semitransparent pale horn, adults opaque yellowish-white.

(b.) *S. luteola.* No doubt the same species as *texasiana*, but the specimens are horn-color and smaller; some little ones are more like *putris*—7½ mill. long, shiny, striate, horn-color, more globose, spire short.

Sect. III. *Lucenæ.*

=*Lucena* Oken.

(19.) *S. avara* Say. This species varies in color a good deal, and also in shape. The following are the varieties described or known to me.

(a.) forma *alba* nov. Shell greenish-white. Horseshoe Bend Gulch, Custer Co., Colorado, at about 10,000 ft. alt. Mr. H. Prime has an albino of *S. avara* from Arizona, and there is a specimen in the Binney and Bland collection from New York State (Dr. Lewis.)

(b.) forma *wardiana* Lea. Shell yellow.

(c.) var. *vermeta* Say. Yellowish, thin, suture deep. I have seen a clear red-brown form of this from Toronto, Canada (D. B. Cockerell). An amber-colored form was sent to me by Mr. Binney, collected by Mr. W. S. Teator at Barrytown, Duchess Co., N. Y.—this may also fall under *vermeta.*

(d.) var. *compacta* Ckll. J. of Conch., 1892, p. 39. Colorado.

(e.) forma *major* W. G. Binney, Ac. Nat. Sci. Phila., Nov., 1858, sine descr. A large variety, about 13½ mill. long, in the Binney and Bland collection, is from Utica, N. Y. It is marked var. *major*, apparently in Mr. Binney's handwriting.

(20.) *S. aurea* Lea. I formerly supposed this might be closely allied to *pfeifferi;* having received a close relative or variety of that species from St. Thomas, Ontario, Canada (D. B. Cockerell), which seemed to agree with *aurea.* This view, however, was probably erroneous, as a specimen marked *aurea* in the Binney and Bland collection seems to belong to the *avara* section.

(21.) *S. mooresiana* Lea. I have found shells in a dry locality on Round Mountain, Custer Co., Colo., which, although no doubt referable to a variety of *avara,* appear to be Lea's *mooresiana.* A specimen of *mooresiana* in the Binney and Bland collection, from the Platte River, also seems to belong to *S. avara.*

(22.) *S. oregonensis* Lea. Mr. Singley sent me this from Dalles, Oregon, (E. H. White). I noted that they were of the *avara* group, but in shape approaching the *pfeifferi* group, pale reddish-horn, striate, dull. One in the Binney and Bland collection looks like a member of the *pfeifferi* group, but another, marked with a query, is larger and seems to belong to the *avara* section.

(23.) *S. rusticana* Gould. Mr. Singley sent me some shells labelled *oregonensis* from Plumas Co., California (G. W. Michael), of which I noted: *avara* group, larger than *oregonensis* from The Dalles, greenish-horn, more shiny, whorls more convex. These specimens seemed to agree better with *rusticana* than *oregonensis.* Later, Mr. Binney has sent me a shell, apparently *rusticana,* found by Mr. Hemphill at Julian City, San Diego Co., California. This shell is 10¾ mill. long, form of *rusticana,* but aperture more oblique, color reddish-horn, rather shiny; soft parts (in alcohol) black. It is impossible to tell whether

these shells should be separated from *rusticana* without examining a larger series showing the variation.

(24.) *S. verrilli* Bld. Apparently belongs to sect. *Lucenæ*, but I have not seen specimens.

(25.) *S. grœnlandica* Beck. Specimens in the Binney and Bland collection from Kuksuk, Greenland, almost certainly belong to this group; although the species seems to have leaning toward the *Campestres*, with which it allies itself through *S. chrysis* and *S. annexa*.

Section IV. *Campestres.*

(26.) *S. campestris* Say. Mr. Singley sent me specimens of this from Long Key, Florida; they seemed to me nearly identical with *S. lineata* from Kremmling, Colo. A variety of *campestris* was named *inflata* by Lea.

(27.) *S. lineata* W. G. Binney. Found in rejectamenta at Kremmling, Colo., together with a form *elongata*, Ckll., J. of Conch., 1892, p. 39.

(28.) *S. greerii* Tryon. This is considered a synonym of *S. obliqua*, but a dead shell in the Binney and Bland collection from Vicksburg, Miss. (Tryon), appeared to resemble *campestris*.

(29.) *S. chrysis* Westerl.

(30.) *S. annexa* Westerl. This and the last appear to belong here, but are probably related somewhat to *grœnlandica*. The presence of whitish streaks on the arctic species is noteworthy. Dr. von Martens (Conch. Mittheilungen, 1885) has described a var. *aurelia* of *S. chrysis* from Alaska.

(31.) *S. unicolor* Tryon. A specimen so named is in the Binney and Bland collection from New Orleans, La. It is a peculiar shell, apparently of sect. *Campestres*, very globose, spire short and blunt.

(32.) *S. turgida* Westerl. This species is unknown to me; it is recorded in Land- och Sötv. Moll. Vega-Exped. 1885.

(33.) *S. decampii* Tyron. Belongs to *Amphibinæ*, and was accidently omitted in the proper place. It is considered a form of *ovalis*, but a specimen from Michigan (Tryon), in the

Binney and Bland collection seemed hardly quite like *ovalis;* small, shiny, thin, rather greenish.

Of these 33 nominal species of *Succinea*, possibly not more than about half will prove valid, but it is impossible to arrive at any exact results without further research into the variation, anatomy and distribution of the several forms.

The distribution, so far as known, present some features of interest. The species of the eastern and northern states are more like those of Europe than the southern or western. The southern and northwestern distribution of the *campestres* is noteworthy. It appears that in glacial times, owing to a warm current, the coast of Alaska was free from ice, while that of British Columbia was glaciated down to the sea[1]; hence a contingent of the *campestres* may have survived to the north, while their representatives in some of the middle regions were exterminated.

While on the subject of *Succinea*, it may be worth while to call attention to fig. 13 of pl. II, Bull, U. S. Geol. Survey, No. 34, (1886). The fossil there figured is referred by Dr. C. A. White with doubt to *Limnæa*, but is it not a *Succinea* of the section *Lucenæ?*

Regarding the Calif. *Succ. stretchiana* (Naut. VI, p. 72), I fear the specimens were in a box which unfortunately got lost in the post on its way back to Mr. Singley. They *seemed* to represent a distinct form, but it is possible that they were not true *stretchiana*. Bland's type was from Washoe Co., Nevada; and no doubt the specimen from that locality in the Binney and Bland collection belonged to the original lot, the actual type being in U. S. N. M. (see Man. Amer. Land Shells, p. 497). The Washoe Co. specimen examined by me was in some respects like *avara*, and by no means altogether like the Californian examples; but considering the variation seen in species of *Succinea*, I did not feel able to decide without better material, whether they should be held distinct, and so accepted the indication of the labels. There is a Colorado *Succinea* which was formerly thought to be *stretchiana*, but it is certainly either a var. of *avara* or a species very closely allied. Is anyone prepared to say exactly what distinguishes *stretchiana* from other species? If the San Francisco specimens were not *stretchiana*, I am rather puzzled to know what are the true characters of the species. Perhaps the anatomy would settle the question.

[1]See Prestwich, Geology (1888) Vol. II, p. 464.

GENERAL NOTES.

VITRINA LIMPIDA IN PENNSYLVANIA.—In April of this year I found about a dozen dead shells of Vitrina limpida Gould on the bank of the Ohio River about 14 miles below Pittsburg, I have since visited the place and found about 20 additional shells all dead and most of them broken. There were many more too badly broken to be worth taking. A careful search both times failed to bring any live shells to light, and as many of the shells found were young I think the colony must have become extinct last year. They were found among "drift," so *may have come* from the head-waters of the Allegheny River in New York State.

I intend visiting the place again soon and will report results.—*Geo. H. Clapp, Pittsburg, Pa.*

ARGONAUTA FOUND ALIVE.—A living specimen of the Paper Nautilus, *Argonauta argo*, was found at Palm Beach, Dade Co., Fla., in April by Mrs. C. Rowland of Philadelphia. This handsome shell is over six inches in diameter. It is rare that living examples of this are found on our coast.

The *West American Scientist* for July contains a biographical sketch of the late Henry Chandler Orcutt, of San Diego, Cal.

A RARE OLD BOOK.—An auction sale of old and rare books took place here a few days ago. This collection was consigned to a prominent auctioneer direct from Great Britain (around the Horn). I was lucky enough to have a catalogue sent me. In looking same over, I found only one book on Conchology. It was numbered 324 and described as "Collection de differentes especes de Coquillage, par George Wolffgang Knorr. Both parts, plates giving hundreds of beautifully colored figures of rare shells, 4to"

I attended the sale and when no. 324 was put up the bid started at 50 cents; I went one better, 55, then two prominent bookdealers began bidding with me, until one of them struck the dollar limit and ceased. I went one better, bidding $1.10; and as they saw that I was determined to get it, they stopped; and the book was knocked down to me for the above ridiculously small amount.

Upon reaching home I found it to be published in French, and during the *reign of King Louis XV*—1765, although George

Wolffgang Knorr, the author, states he wrote it during *Nov.* 1756 at Nuremberg. The print is in the old style; very large.

The book contains 100 pages, has 47 plates containing 248 exquisitely water-colored (by hand) figures of shells.

Think of the time it must have taken to color these! How I would like to have a glimpse of the person who colored them, 129 years ago! Some of the tints, especially the pearly ones used in Haliotis striata, Haliotis marmorata and Trochus niloticus, are something wonderfully clever.

On the inside of the cover, was a piece of paper glued. On it was engraved a crest of some person, with the words "Navitir et Solerter," and underneath it was engraved the following:—"Daniel Cresswell, S. T. P. Coll: S. S. Trin: apud Cant: Soc." The crest was composed of a large ostrich with a nail in its mouth. Beneath this was a shield, within same were three squirrels sitting on their hind legs, eating acorns or something of that sort. Upon close investigation, I discovered this crest was pasted over another. With a great deal of trouble I succeeded in separating the two. The lower one was an egg-shaped circle, within was a shield with three holes in the upper portion. On top of the shield rested some kind of a royal head-gear. Upon this head-gear lay a mummy and upon the mummy an eagle had just alighted, and was in the act of tearing out the eyes of the mummy. Under the crest was the signature of "JOHN LATHAM, M. D., Winchester."

Who can tell me anything about the persons above named? Also if there are many of these books in existence. I should judge they were quite rare. How I do wish that many other British collections of old books might be brought here and sold at public auction. Many rare books published during 1567–1656–1780 and 1800 were sold at the above sale, all the way from 25 cents to $5.00—*Williard M. Wood, San Francisco, Cal., March* 15, 1893.

EXCHANGES.

LAND AND FR.-WATER SHELLS of Eastern Pennsylvania to exchange for Land, Fresh-water or Marine shells from other localities.—*Walter Black,* 541 *James Ave., Roxborough, Phila., Pa.*

1.

2.

3.

4.

5.

CRETACEOUS FOSSILS.

THE NAUTILUS.

VOL. VII. SEPTEMBER, 1893. No. 5

ILLUSTRATIONS OF NEW CRETACEOUS SHELLS.

Volutoderma Woolmani Whitf. Plate II, figs. 4, 5.

Described in the Nautilus (August) Vol. VII, p. 37. Lenola, Burlington Co., N. J.

Cerithium Pilsbryi Whitf. Plate II, fig. 3.

Described in the Nautilus (August) Vol. VII, p. 38. Lenola, Burlington Co., N. J. Drawn from a guttapercha squeeze of the natural cast.

Since the publication of Mr. Woolman's article on the cretaceous fossils found at Lenola, near Moorestown, Burlington Co., N. J., in the Proc. of the Acad. Nat. Sci. of Phila., 1893, page 219, the following additional species have been found by Messrs Morris Schick, Robt. Hancock, John G. Johnson and Chas. L. Thackeray.

LAMELLIBRANCHIATA.[1]

Cyprimeria densata Conr. Vol. I, p. 157, pl. XXII, figs. 19–21.

Lucina Smockana Whitf. Vol. I, p. 130, pl. XVIII, figs. 21, 22.

Arca quindecimradiata Gabb. Vol. I, p. 208, pl. XXVII, figs. 10–13.

Crassatella conradi Whitf. Vol. I, p. 209, pl. XXVIII, figs. 1–5.

[1] The references after specific names are to Whitfield's Paleontology of N. J.

Modiola (*Lithodomus?*) *inflata* Whitf. Vol. I, p. 197, pl. XXVI, figs. 13, 14.

Inoceramus sagensis Owen. Vol. I, p. 76, pls. XIV, XV, figs. 15, 1, 2.

Inoceramus sagensis var. *quadrans* Whitf. Vol. I, p. 79, pl. XV, fig. 16.

Cardium sp.

DESCRIPTION OF A NEW FOSSIL CYPRÆA.

BY JOHN H. CAMPBELL.

Cypræa Squyeri n. s. Plate II, figs. 1, 2.

Shell ovate-oblong, attenuated at the extremities. Spire prominent, showing four whorls; outer lip thickened and having on the inner edge thirteen or fourteen teeth. Anterior half of the aperture wide, but contracted at the extremity, posterior end contracted and projecting slightly beyond the spire. Under the magnifying glass the shell shows strong revolving raised lines and striæ. Length 20 mm., width 11 mm., height 9 mm.

A notice of the finding of this shell by Mr. Homer Squyer of Mingusville, Mont., in the cretaceous formation (Fox Hills Group) of eastern Montana, and the above proposed name, were published in the NAUTILUS Vol. VI, p. 50. This shell resembles in outline the recent *Cypræa stolida*, but its very prominent spire would separate it from this group. Shell structure is wanting on most of its dorsal surface and the inner lip obscured by the hard matrix, which it would be inadvisable to remove. In a recent letter from Mr. Squyer he says "This summer while looking for fossils I found the outer lip of the imperfect specimen, found at the time I obtained the type. This specimen I have sent to the U. S. National Museum." The type has been placed in the collection of the American Association of Conchologists.

PRELIMINARY NOTICE OF NEW SPECIES OF LAND-SHELLS FROM THE GALAPAGOS ISLANDS, COLLECTED BY DR. G. BAUR.

BY WM. H. DALL.

Bulimulus (Næsiotus) duncanus n. s.

Shell short, stout, inflated, thin, with wrinkled and slightly gran-

ulose surface and six and a half whorls; apex rather pointed, whorls rapidly enlarging, the suture behind the last whorl deeper than the rest, aperture relatively small, rather oblique; the lip simple, not reflected, a single tubercle on the body whorl well within the aperture and about equidistant from either lip; umbilicus perforate, narrow. Alt. of shell 18; of last whorl 12·5; diam. of shell 11 mm.

Duncan Island, Baur; no living ones seen.

Bulimulus (Næsiotus) amastroides Ancey var. **Anceyi** Dall.

Shell resembling *B. amastroides* Ancey but with more plicate surface, ruder aspect, smaller mouth and more angular periphery. Lon. 9, lat. 4·5 mm.

Chatham Island, 1600 feet; Baur.

This may prove merely a depauperate variety of *B. amastroides*, but at first sight it looks very different.

Bulimulus jacobi var. **vermiculatus** Dall.

Shell with five and a half sharply granulated, wrinkled whorls; suture deep, aperture small, simple, thin-edged; umbilicus perforate, rather large but not funicular. Lon. 8, lat 5·5, alt. of last whorl 6·0 mm.

James Island at James Bay, Baur.

Resembles a dwarf *B. jacobi* with very sharp, beaded, alternate granulations in spiral rows; transverse wrinkles small but distinct; the spire pointed but the apex rather blunt.

Bulimulus olla Dall. (**B. jacobi** Reeve, Icon., not of Sby., Conch. Illustr.)

Duncan, Indefatigable, and Barrington Islands, Dr. Baur.

This shell is closely related to *B. jacobi* and was figured by Reeve under the name of *jacobi*. The original *jacobi* was sent by Cuming to Dr. Lea and subsequently a specimen of Reeve's form was added by Mr. Cuming. These are now in the Nat. Museum.

The true *jacobi* is smaller, and is sharply spirally sculptured with fine lines of beaded granules alternating in size, every fifth or sixth row being larger. It has six inflated whorls and a pale peripheral band. *B. olla* has a nearly smooth almost polished surface, only marked with incremental faint lines, seven whorls and a very bulbous pillar. It is a larger shell than the original *jacobi*. The latter comes from James, Albemarle, Charles and Chatham Islands, in the wooded zone, while *B. olla* inhabits the grassy upper zone.

Bulimulus (Næsiotus) tortuganus n. s.

Shell small, solid, moderately elongated with six and a half whorls; the earlier whorls subtranslucent madder brown with a pale peripheral stripe, more or less silky and sculptured with very fine spiral lines; sutures very distinct; later whorls malleated, wrinkled or pecked; rude, fleshy white, with a variably large perforate umbilicus; aperture small, with a lump on the pillar and another within the middle of the outer lip; lips thickened, white, slightly reflected, the throat brownish, body with a thin, transparent callus. Lon. of shell 12, of aperture 5·5; max. diam. of shell 7 mm.

La Tortuga, grassy zone, South Albermale, Baur.

This shell which is very characteristic seems to be abundant where found by Dr. Baur. It seems nearest to *B. simrothi* Reibisch. of the described species. It is remarkable for the illustrations it gives of the varied influence of the environment on different individuals. The sculpture of the last whorl recalls that of *B. rugiferus*. The young is hispid and colored like that of *unifasciatus*, but is narrower; the pale peripheral band is almost wholly obscured in the adult and the hairs are soon lost.

Bulimulus (Næsiotus) Bauri n. s.

Shell small, short, stout, with a dark rapidly attenuated spire, distinct suture, and opaque yellow-brown last whorl; whorls about seven, the earlier ones dark livid purple with straw colored streaks, paler at the suture, rude and malleated; last whorl inflated, more or less transversely wrinkled, somewhat polished; umbilicus closed or a mere chink; aperture subquadrate, angulated behind and at the base of the pillar; pillar short, oblique; lips simple, thick, especially across the body where the callus has a raised edge; throat white. Lon. of shell 10, of aperture 4·5; max. lat. of shell 6·5 mm.

Hibernating on the under side of leaves of plants at the Southwest end of Chatham Island, 1600 ft. above the sea, Dr. Baur.

This is one of the most distinctive species of the whole group.

Hyalinia chathamensis n. s.

Shell small, thin, straw colored, depressed, with four rounded polished whorls; suture distinct; sculpture of numerous radiating, slightly flexuous, indented lines; umbilicus deep, exhibiting all the volutions, but rather narrow. Max. diam. 3, min. diam. 2·25 mm.

Alt. of shell 1·30 mm.

Chatham Island, 1600 feet, 1 specimen, Dr. Baur.

This shell recalls *H. arborea* Say, but is much smaller and has a different umbilicus. In the characters of the aperture, etc., not mentioned above, it duplicates *arborea*.

Conulus galapaganus n. s.

Shell close to *C. fulvus*, but has five whorls to four in a specimen of *fulvus* of the same diameter; it has a very well marked suture and the whorls between the sutures are more rounded than in *fulvus*. The height of *C. galapaganus* is greater in proportion to the number of whorls. Alt. of shell 3·25; max. diam. of shell 2·5 mm.

Chatham Island, 1600 ft., Dr. Baur.

This shell appears to differ from all the forms like *fulvus, selenkai, cœcocides, etc.*, by its smaller size, very brilliant surface, inflated whorls and number of turns. It wants entirely the spiral striation of *Zonites bauri* which is a much larger and more depressed shell. In fact it seems like an elevated, dwarfed and inflated *C. fulvus*.

There are probably other Helices on the islands which have not yet been collected.

Succinea corbis n. s.

Shell small, of two and a half whorls, to which a black mould adheres with tenacity. The first whorl and a half are salmon pink in the adult but the young of the same size are pale amber. In the adult the last whorl is of a pale straw color. The shell resembles *S. wolfi* in form but is smaller and has a more contracted aperture; it is instantly recognized, when examined with a good lens, by its surface which is minutely shagreened all over with an excessively fine network of closely recticulated incised lines. Alt. of shell 4., max. diam. 4; extreme length of aperture 4 mm.

S. Albemarle Island on dry bones of turtles, Dr. Baur.

The remarkable sculpture is not visible to the naked eye except as a sort of hoary bloom on the surface. Under a compound microscope it looks like closely woven basket work. I have examined a great many Succineas without finding any other species possessing this character. The sparse dichotomous impressed sculpture which appears on Succineas from Samoa and other oceanic islands and is occasionally visible on *S. bettii* is an entirely different thing.

I may add that the *S. bettii* var. *brevior* of Smith, is in my opinion distinct from *S. bettii* and should be raised as *S. brevoir* to specific rank. I have examined a large number of both forms. *S. bettii* is a species of the wooded zone, *S. brevior* of the dry zone. It is probable that *S. wolfi* Reibisch may be only a variety of *S. bettii*.

The final report on Dr. Baur's collections will not long be delayed. The species will be figured and their anatomical characters discussed. The most important fact thus far determined is the close alliance of all the *Nesiotes*, *Rhaphiellus* and *Pleuropyrgus* to the American *Bulimuli* of the type of *B. serperastrus*. The different forms of the shell are dynamic not genetic differences, and there is no doubt as to the exclusively American type of the whole fauna, when the groups represented are not of world wide distribution.

PRELIMINARY NOTE ON THE SPECIES OF STROBILOPS.[1]

BY H. A. PILSBRY.

The United States species of this genus have generally been believed to be but two in number, the "*Helix*" *labyrinthica* of Say, and *Hubbardi* of A. D. Brown; the types of both being in the museum of the Academy of Natural Sciences of Philadelphia.

The writer some months ago, gave the varietal name *virgo* to specimens sent him for determination by Rev. H. W. Winkley,[2] and later the name *affinis*[3] to another form.

Recently, with the assistance of Mr. H. E. Sargent, the various species and varieties have been re-examined and compared, with the result of finding that, in what has hitherto passed as "*H. labyrinthica*," there seem to be at least three well marked species. These species agree in general form and sculpturing, but differ in size, color, degree of depression, and especially in *the internal lamellæ* of

[1] *Strobilops* Pilsbry, Proc. Acad. Nat. Sci. Phila., 1892, p. 403, *Strobila* Morse 1866, not *Strobila* Sars, 1833, nor *Strobilus* Anton, 1839.

[2] Nautilus.

[3] Proc. Acad. N. S. Phila., 1892, p. 404, (no description).

basal and outer walls of the body whorl. In this they are comparable to the Clausilias, Endodontas, etc.

The species may be tabulated thus:

a. Internal lamellæ on floor of body whorl 2 or 3, short; color dark brown; one parietal fold conspicuously emerging from aperture.

b. Form elēvated conoidal . . . *S. labyrinthica* Say.

bb. Form much depressed . . *S. labyrinthica strebeli* Pfr.

aa. Internal lamellæ on floor and adjacent side wall of body whorl 6 or more.

b. 6 long lamellæ; 2 parietal folds emerging; color white or pale brownish; form elevated, . . *S. virgo* Pils.

bb. About 8 short lamellæ arranged in a curved radial series; color dark brown; form elevated . . . . *S. affinis* Pils.

The figures of Morse and Binney represent *S. labyrinthica* Say.

The *S. labyrinthica strebeli* Pfr. was described from Mirador, Mexico, the specimens before me being from that locality. It was well figured by Pfeiffer in the Malakozoologischer Blätter viii, pl. 1, figs. 5–8; but Crosse and Fischer's figures (Moll. Mex.) do not represent it. They were probably drawn from a specimen of *S. virgo*, but certainly not from *strebeli*. Mr. Sargent has found a form closely resembling the Mexican *strebeli*, at Woodville, Ala.

The original examples of *S. virgo* are greenish-white in color. They were collected by Rev. H. W. Winkley near Sebec Lake, Piscataquis Co., Maine. Mr. Sargent has found a form of the same species at Woodville, Ala., where they are of a light brownish tint.

S. affinis is a large form, very abundant at many localities in New York, Ohio, etc. Its prominent feature is the armature of numerous short lamella, extending in a forwardly curved series from the axis across the base and up the side wall.

The writer wishes to prepare an illustrated paper upon these forms, and will be glad to receive specimens from as many localities as possible, and especially western and southern localities. Anyone sending specimens will receive in return (if they wish it) a copy of the pamphlet "Preliminary Classification of the Helices," and, when it is issued, a copy of the projected paper on *Strobilops*.

CHARLES B. FULLER.

BY REV. HENRY W. WINKLEY.

The death of Mr. Charles B. Fuller, which occurred in April last, removes from our midst a man who had been a most enthusiastic worker in the Natural History of the State of Maine. Since 1858 he had been Curator of the museum of the Natural History Society of Portland, and the results of his labor have greatly enriched that museum. His interest in Conchology was great, and though he never published his results, the rooms of the society show what his labor was. I had several times suggested that he allow me to send his name for membership in the Association but his reply was "I am too old now and cannot help them." He has however helped many, and some of our younger members will recall him as ever ready to assist. Though quiet and retiring, he soon became a warm friend to one who loved Nature. His work and influence must live for a long time, though he is no longer present.

THE NEW POSTAL RULING.

It has always been recognized that scientific research is greatly furthered by the exchange of the various objects with which that research is concerned. For the transmission of objects of natural history from one country to another, the mails have offered a cheap and speedy means. Heretofore, through the laxity with which the regulations have been enforced, it has been possible to enter such objects in the mails of the Universal Postal Union as "samples of merchandise," and under the rates of postage therefor. From official information lately received from the United States Post Office Department, it appears that such a rating is entirely unauthorized by existing provisions, and that objects of natural history may only be mailed by the rates required for letters. The United States Post Office Department also stated that it had recently submitted a proposition to the countries comprised in the Postal Union,

to modify the regulations so that such specimens may be entered in the mails as "samples of merchandise;" but that a sufficient number of countries had voted against the proposition to defeat it. Those countries voting negatively were Austria, Bolivia, British India, Canada, Germany, Great Britain, Guatemala, Hungary, Japan, Norway, Portugal, Russia, Spain, Sweden, Tunis, Uraguay and Venezuela.

The Academy of Natural Sciences of Philadelphia has appointed, through its President, a Committee (Chairman, Mr. P. P. Calvert) to address the various scientific bodies with which it is in communication in those countries, and to request them to memorialize their respective Governments in favor of the proposed modification. The letter rate for postage in the Postal Union is ten times that required for samples of merchandise, so that the former is virtually prohibitive.

In view of the fact that the subject is one which concerns all Zoologists, the NAUTILUS would urge its readers to use such influence as they may be able in favor of the proposed change. Foreign Conchologists living in the countries named above, will, it is hoped, exert their influence toward the modification desired.

NOTES AND NEWS.

MR. E. W. ROPER of Revere, Mass., returning from Chicago, visited the Conchological fraternity of Washington and Philadelphia recently.

DR. B. SHARP of the Academy of Natural Sciences of Philadelphia has departed on a scientific mission to the Sandwich Islands. He expects to return in December.

A VALUABLE MONOGRAPH upon the "Pleistocene History of Northeastern Iowa," by W. J. M'Gee appears in the Eleventh Annual Report of the U. S. Geological Survey, just issued.

The senior Editor of the NAUTILUS is engaged upon a guide of the Heliciform land snails. All of the genera and subgenera will be thoroughly defined, both as to shells and anatomy; a number of species of every subdivision will be figured, the anatomy will be figured, and the species of each group will be enumerated. An

immense amount of new information, not to be found in any of the conchological manuals, will be offered. The work, it is believed, will form a complete text book of the subject, and will be indispensable to the student of land snails.

Prof. Ralph Tate describes a number of interesting new Australian gastropoda in the Tr. Roy. Soc. S. Austr. June, 1893. Among them are the following *Turbinidæ* and *Trochidæ*; *Astralium rutidoloma, Clanculus consobrinus, euchelioides, Thalotia neglecta, Calliostoma spinulosum, Euchelus fenestratus, pumilio, vixumbilicatus, annectans,* and *E.* (*Hybochelus*) *ampullus.* He states that *Euchelus tasmanicus* Tenison-Woods is the same as *E. scabriusculus* (Angas) Fischer, the type of Pilsbry's subgenus *Herpetopoma.* A supplemental list of S. Australian mollusca is also given.

Olfactory organs of Helix. Dr. A. B. Griffiths (Proc. Roy. Soc. Edinb. 1892,) contends that Sochaczewer's experiments, by which he showed that the tentacula of *Helix pomatia* are not olfactory organs, were untrustworthy from his use of turpentine, which gives off a vapor that is irritating to the sensitive tissues generally. If snails are placed on flat slabs, the edges of which have been smeared with eau de cologne, methyl or ethyl acetate, liquids the vapors of which are not irritants, such as have the tentacula removed gradually approach the edges of the slabs, while those whose tentacles are uninjured turn away from the edges. He concludes, therefore, that the tentacles are the seat of the olfactory organs in *Helix.*

The Mid-August number of the *Zoologischer Anzeiger* contains an excellent portrait of J. Victor Carus, in commemoration of his seventieth birthday.

Mr. A. Belt, in writing of the mollusks of Dorset, (England) gives the following interesting notes. It is well known that thrushes in seasons of scarcity hunt for snails, and to extract the animal break the shell by beating it against a stone. Stones that have been used for this purpose, with the broken shells lying around them are frequently noticed but I had never before found them in such profusion as on the present occasion. A very large proportion of the 576 specimens of *Helix nemoralis* and *H. hortensis* found consist of these fragments. In fact, the birds had so thoroughly worked the district that until a heavy fall of rain induced the snails to come forth from inmost hiding-places, I did not find more than a dozen live shells of these species. On one occasion I found 42 *H. aspersa, H. hortensis* and *H. nemoralis* round one stone.

PILSBRY.—NEW N. JERSEY AND MEXICAN SHELLS.

THE NAUTILUS.

VOL. VII. OCTOBER, 1893. No. 6

ILLUSTRATIONS OF MEXICAN MELANIANS.[1]

BY H. A. PILSBRY.

The distribution of the Melanians and of land operculates in the Americas forms a most interesting chapter in zoogeography. As is well known, the family *Pleuroceridæ* comprises all of the Melanians found living in North America above the Rio Grande; and moreover no members of this family or subfamily are known to exist outside of this area. South of the Texas boundary there are few melanians or none throughout northern Mexico; but as we approach the isthmus of Tehauntepec the characteristic neotropical genera *Pachychilus* and *Hemisinus* appear, and are represented by a considerable number of species and innumerable local races. The richness of this fauna in varietal forms rivals the prolific streams of Tennessee and northern Alabama. Every spring and stream has its peculiar variations, often so distinct typically, that the naturalist is tempted into extravagance in naming them as species. The illustrations here with given represent some of the forms of *Pachychilus glaphyrus* from the State of Tabasco, sent to the Academy of Sciences by Professor ROVIROSA, a zealous and enlightened naturalist of that State.

[1] Reprinted by permission from the Proc. Acad. Nat. Sci., Phila.

Pachychilus glaphyrus Morelet.

This species is an exceedingly variable one, more so perhaps than any other Mexican Melanian. The American student, however, will readily call to mind cases of equal variability among the species of our Southern States. The material sent by Prof. Rovirosa comprises a number of varietal forms not before made known.

P. glaphyrus Rovirosai Pils. (Pl. I, figs. 9, 10.)

Shell large and heavy, elevated conical, the lateral outlines straight above, modified by the slight convexity of the whorls below. Spire more or less truncated at tip, half-grown specimens, (Pl. I, fig. 9,) possessing 8 remaining whorls; adults, (Pl. I, fig. 10,) having one or two whorls less.

Surface most minutely spirally striated the striæ visible only under a lens. Young and half-grown specimens are otherwise smooth, except for very slight spiral liræ toward the base. When a little more than half-grown, there appear coarse, oblique, curved wave-like folds on the body-whorl, extending to the periphery but not below it. Simultaneously with these undulations, begin spiral spaced liræ crossing them, which are slightly more prominent on the crests of the waves. This sculpture continues upon all subsequent volutions. The last volution of an adult specimen is slightly compressed below the suture, then quite convex. It has ten waves, and about nine spiral liræ, but the number of these last is quite variable on different specimens.

The color is olive in young, blackish in old examples: interior of the mouth white, maculated with brown at the position of the periphery and folds. This marking is also seen on the eroded spire in some specimens.

Aperture ovate, acute above, slightly exceeding one-third the total length of the shell. Columella white, regularly arcuate, spreading in a brown-tinted callus.

Dimensions. An adult specimen measures: Alt. 78, diam. 28 mm. Aperture, alt. 25, width 18 mm. A younger specimen measures: Alt. 56, diam. 20 mm. Aperture, alt. 20, diam. 12½ mm.

Collected from a spring which gushes from the western brow of the little ridge of the Limon, State of Tabasco, Mexico.

This form is allied to *P. glaphyrus* typical, and to the var. *scamnata*, but it is distinct from both. The form is notable for its stout, straight-sided spire, non-impressed sutures, and the unsculptured young.

P. glaphyrus var. between **polygonatus** and **immanis.** (Pl. III, figs. 5, 6.)

The two specimens figured are of the same size but differ in sculpture. One (fig. 6) is smooth above and below, having a strong subspinous keel at the periphery, and a smooth, acute keel below it. Upon the earlier whorls of the spire there are longitudinal waves, and two spiral cords above the peripheral keel, which diminishes in size. The base has no spirals. The other specimen has the entire body-whorl spirally lirate (liræ on body-whorl 9, on penultimate whorl 3) and strongly plicate.

P. glaphyrus potamarchus. (Pl. III, fig. 7.)

This is one of the largest forms of *Pachychilus* known, and it is the most aberrant of the *glaphyrus* stock. The shell is rather slender and acutely conical, the outline of the spire being straight. The aperture is ovate, narrowed above, and one-third the length of the shell. Whorls 10–11 remaining, several of the earlier being lost by erosion. The microscopic sculpture is the same as in var. *Rovirosai*. There are no traces whatever of the waves or folds so prominently shown by the other varieties of *glaphyrus*, and the spiral cords are also completely obsolete, or indicated by the faintest traces on the base. The color is olive-green or olive-brown.

Alt. 99, diam. 33 mill.

Alt. 87, diam. 29 mill.

Tabasco, Mexico.

This variety differs from the *pyramidalis* of Morelet in being larger and smoother, lacking altogether the chestnut colored spirals of that form.

Potamanax subgen. nov.

Shell solid, oval with short conic spire, spirally sculptured or banded. Aperture ovate, acute above, broadly rounded below; outer lip not sinuous; inner lip more or less heavily calloused, not notched at the base. Operculum few-whorled, with basal nucleus. Type *P. Rovirosai* Pils.

This group has the sculpture of *Hemisinus* but differs from that genus in the entire, un-notched basal lip. The columella callus is much like some species of *Pachychilus* but the operculum is very different from that genus. From both of these groups it differs in the short, ovate contour of the shell. The description of the operculum is taken from *Melania brevis* d'Orbigny of Cuba, which I consider congeneric.

The relationship of *Potamanax* to *Hemisinus* in sculpture and operculum is obvious, and has caused me to regard it as an subgenus

rather than a distinct genus; but the total lack of a basal notch or truncation is a character usually considered of generic importance.

P. Rovirosai n. sp. (Pl. III, figs. 8, 9.)

Shell oblong-conic, very solid, whitish, encircled by numerous narrow smooth spiral liræ of a dark brown color, and somewhat alternating in size. Spire conical, apical whorl eroded; whorls 5 remaining, slightly convex, the last whorl large, regularly convex. Aperture a little less than half the length of the shell, ovate, angular above; outer lip regularly acute; inner lip strongly calloused.

Alt. 20, diam. 12 mill. (old specimen.)

Alt. 16½, diam. 9¾ mill. (young specimen.)

Two specimens are before me, collected by Prof. Rovirosa at the mountains of Poana, State of Tabasco. The older individual (Pl. III, fig. 8) is considerably worn; the other is perfect but not wholly adult, and neither contains the operculum. The species is allied, apparently, to the Cuban *Melania brevis* Orb., but is decidedly longer, and the liræ are much stronger.

Explanation of Plate III.

Figs. 1, 2, 3, *Chrysodomus* (*Sipho*) *Stonei* Pils.
Fig. 4, *Eucalodium compactum* Pils.
Fig. 5, 6, *Pachychilus glaphyrus* var.
Fig. 7, *P. glaphyrus* var. *potamarchus* Pils.
Figs. 8, 9, *Potamanax Rovirosai* Pils.

NOTE ON CYPRÆA GREEGORI FORD.

BY EDGAR A. SMITH.

I sincerely trust that Mr. Ford[1] wrongly estimates the critical acumen of modern conchological students. He says that most of them would probably have made *C. Greegori* a species instead of a variety.

There is no doubt that the new French School of Conchologists would agree with Mr. Ford in considering the shell in question specifically distinct from *C. cruenta*, but I am glad to say that in England (and I hope in America also) the ideas are not so advanced (?). Although examples of this shell have been in the National collection for more than 50 years, no British author has ever suggested that they belonged to a distinct species.

[1] Nautilus, Vol. vi, p. 112, Vol. vii, p. 39.

I fully admit that the differences pointed out by the author are fairly constant, and that examples are pretty easily separable from the typical form of *cruenta*. But admitting this does not prove that they ought to be held specifically distinct, and I venture to suggest that they only constitute a recognisable race or variety of an already known species.

The chief object of this note, however, is to make complaint respecting the name which Mr. Ford has imposed upon his so-called species.

When he published *Greegori* as a varietal name, it was already five years previously preceded by Mr. Melvill's varietal name *coloba*,[1] and therefore there is no question I think, which name should be employed if this variety be regarded as a distinct species. Right and justice (*and even courtesy*) at once direct us in the present case.

Mr. Ford is under the impression that Mr. Melvill was in a state of uncertainty whether the form in question was a variety of *cruenta* or *caurica*. I find no such impression conveyed by Mr. Melvill's sentences which are criticised by Mr. Ford. Moreover, in the catalogue of species (l. c., p. 243), Mr. Melvill ranges the var. *coloba* under *cruenta* and in addition gives a representation of the ventral side of the shell (Pl. I, fig. 7).

LAND MOLLUSCA OBSERVED IN THE GASPE REGION.

A. W. HANHAM, QUEBEC.

About the middle of May last I left Quebec for Gaspé Basin, by the way of Port Dalhousie, N. B. and the steamer "Admiral." It was my intention to spend a week or more in this district collecting shells and insects.

Unfortunately I found the season very backward up there, the weather too was wet or cold during my stay; owing to this but little collecting could be done, and I was more than disgusted having journeyed so far for so little purpose.

The following specimens were taken or seen at Barachois, near Mal Baie; this village is at the inner end of a deep bay, and is distant from Gaspé Basin some 25 miles, and from Percé about 10 miles.

With a few exceptions the land shells collected were found living in the grass on a sandy hillside close to the beach. The open coun-

[1] Mem. and Proc. Manchester Lit. and Philos. Soc., 1887–8. Ser. 4. Vol. I, pp. 218 and 243.

try was too wet and the woods were too full of snow to be worked at all, in fact it was only in places on the hill side that the snow had melted.

A broad sandy bar, some 5 or 6 miles long, cuts off the ends of the bay at Barachois, leaving a narrow channel at one end: on this bar I was surprised to find *Pupa muscorum* and *Vallonia costata* in the sand under pieces of wood. *Z. radiatulus, P. striatella, A. harpa* and *F. subcylindrica* occurred here rarely, as well as a Vertigo, of which two specimens only were taken.

Helix hortensis was very common on the hillside, generally buried in the sand; several varieties were taken; the plain form seemed to be the least abundant. At the entrance to some burrows I found quite an accumulation of empty shells, and nearly all being entire, many were in very fair condition.

A little collecting under more favorable circumstances would no doubt materially increase this list, from which several of the Northern or universally distributed species are absent.

At Gaspé Basin, *Limnea palustris, catascopium, desidiosa,* and one Physa, most likely *heterostropha,* were found in drift. Some marine species were also taken, but are not yet identified.

Limax campestris Binn. A few.
Vitrina limpida Gld. Frequent. All dead.
Zonites arboreus Say. A few.
" radiatulus Alder. Common.
" fulvus Drap. Two specimens.
Patula alternata Say. Frequent.
" striatella Anth. Common.
Helicodiscus lineatus Say. Rare.
Acanthinula harpa Say. Common.
Tachea hortensis Müll. Abundant.
Vallonia costata Müll. ? A few. Mostly dead.
Pupa muscorum Linn. Frequent.
Vertigo. Two specimens (perhaps two species).
Ferussacia subcylindrica Linn. Common.
Succinea obliqua Say. "
" avara Say. A few.
Carychium exiguum Say. Rare.

[1] Reprinted by permission from the Proceedings of the Academy of Natural Sciences of Philadelphia, 1892, p. 328.

A NEW GASTROPOD FROM NEW JERSEY.[1]

BY H. A. PILSBRY.

At the regular weekly meeting of the Academy of Natural Sciences of Philadelphia, October 18, 1892, Mr. H. A. Pilsbry exhibited a series of specimens of a large species of *Chrysodomus*, belonging to the subgenus *Sipho*, which he had received from Messrs Witmer Stone, Chas. LeRoy Wheeler and John Ford. He stated that the specimens were cast upon the shore during severe gales from the south east, and were evidently derived from a submarine stratum which was disturbed and broken up at those times. Associated with the *Chrysodomus* were examples of *Buccinum undatum*, *Urosalpinx cinereus* of extraordinary dimensions, and *Chrysodomus* (*Sipho*) *Stimpsonii*, the latter being well developed and typical in sculpture. The age of the deposit cannot be definitely settled at present, but the evidence at hand indicates that it is post-pliocene.

The following description of the new species was offered:

Chrysodomus (Sipho) Stonei (Pl. III, figs. 1, 2, 3,). Shell obese-fusiform, rather thick and solid, with strongly convex whorls separated by deep sutures. Sculpture consisting of strong spiral cords, equal on young specimens and on the spires of adults, but which alternate with smaller intermediate cords on the body-whorl in full grown specimens. A young shell therefore has about 20, an adult 40 spirals upon the body-whorl. The aperture is oval: the canal is strongly curved to the left and backward.

Length 72, greatest diam. 45 mm.; length of aperture and canal 51 mm. The largest individual measures, length 100, breadth 64, length of aperture 73 mm. Both of these, as well as all specimens seen, have lost several of the earlier whorls; so the length of a perfect individual would be proportionately greater.

The more prominent features of this species are the swollen form, deep sutures, the strong spiral sculpture, and the strongly recurved canal.

The localities whence specimens have been obtained are as follows: Point Pleasant, N. J. (Witmer Stone); Sea Isle City, N. J. (John Ford, Oct., 1892); Cape May, N. J. (C. LeRoy Wheeler, 1891.)

Prof. A. E. Verrill of Yale College very kindly compared specimens of this species with the collection under his charge (a collection vastly richer than any other in mollusks of the north-west Atlantic.) He writes as follows:

"I have made a careful comparison of the *Sipho* sent by you with our series.

"It differs notably from any thing we have, and is probably, as you suppose, an undescribed species, unless described as a fossil. We have specimens of the ventricose varieties of *S. Stimpsoni*, which equal this in stoutness, and nearly equal it in curvature of the columella, but the whorls are less ventricose, the shoulder less swollen, the sutural region less deep, and the sculpture is very much finer."

Comparisons have also been made by myself with the Atlantic Siphos in the U. S. National Museum, and of course with the recent and fossil series in the collection of the Academy.

SHELLS OF HENRY CO., INDIANA.

BY E. PLEAS.

To judge from such works on the Mollusca as I have had access to, Indiana has not been regarded as having a Molluscan fauna worthy of the attention of the Conchologist. It is not often mentioned in giving localities. W. G. Binney in his very valuable Manual of Am. Land Shells, prints a list of his large collection as presented to the Smithsonian Institute; some 312 species and varieties, only mentions a beggarly 4: *Zonites fuliginosus, Patula solitaria, Triodopsis appressa* and *T. inflecta* as hailing from the Hoosier State.

I have been a student and collector of Mollusca for several years and have made it a point to secure our home shells first, and am able to present the following list collected within 5 miles of my residence near Dunreith, Indiana.

Mesodon albolabris Say.
elevatus Say.
thyroides Say.
" var bucculenta.
Mesoden exoletus Binn.
profundus Say.
multilineatus Say.
Sayii Binn.
clausus Say.
pennsylvanicus Green.
Patula alternata Say.
" var. carinata.
perspectiva Say.
solitaria "
striatella Anth.
Polygyra leporina, Gould.
Stenotrema stenotremum Fer.
monodon Rack.
" var. leaii.
" var. fraternum.
hirsutum Say.
maxillata? Gould.
Triodopsis fallax Say.
tridentata "
palliata "
inflecta "
appressa "
Zonites ligerus Say.

fuliginosus Griff.
intertextus Binn.
exiguus Stimp.
arboreus Say.
indentatus Say.
limatulus Ward.
nitidus Müll.
viridulus Say.
fulvus Drap.
minusculus Binn.
petrophilus Bland?
Strobila labyrinthica Say.
Helicodiscus lineatus "
Vallonia pulchella Müll.
Punctum pygmaeum Drap.
Pupa contracta Say.
pentodon "
corticaria "
fallax "
armifera "
curvidens Gld.
Vertigo ovata Say.
milium Gld.
tridentata Wolf.
bollesiana Morse.
gouldii Binn.
Carychium exiguum Say.
Valvata sincera Say.
tricarinata "
Amnicola porata Say.
cincinnatiensis Anth.
Sayana "
Pomatiopsis lapidaria Say.
Bythinella attenuata Hald.
Melantho integra Say.
Bulimus dealbatus Say.
Ancylus rivularis Say.
Limnaea reflexa Say.
palustris Mull.
desidiosa Say.
humilis "
catascopium Say.
caperata "
Physa gyrina Say.
heterostropha Say.
Bulinus hypnorum L.
Planorbis trivolvis Say.
" var. fallax.
bicarinatus Say.
companulatus Say.
parvus "
Segmentina armigera Say.
Succinea obliqua Say.
ovalis Gould.
avara Say.
" var. vermeta.
Sphaerium sulcatum Lam.
solidulum Prime.
occidentale "
striatinum Lam.
truncatum Lins.
Pisidium abditum Hald.
Unio rubiginosus Lea.
occidens "
luteolus Lam.
sub-ovatus Lea.
gibbosus Bar.
pressus Lea.
gracillis Barr.
phaseolus Hild.
glans Lea.
radiatus Lam.
cocineuus Hild.
spatulatus Lea.
nigerrimus "
ligamentinus Lam.
plicatus Les.
undulatus Bar.
nov-eboraci Lea.
Margaratana marginata Say.
calceola Lea.
deltoidea "

M. rugosa Bar.
Anodonta grandis Say.
plana Lea.
decora "
imbecillis Say.
ovata Lea.
edentula Say.
shaefferiana? Lea.
salmonea "
ferusacciana "
ferruginea Lea.
stewartiana Lea.
subcylindrica Lea.

ON A COLLECTING TRIP TO MONTEREY BAY.

BY WILLIARD M. WOOD.

The editors of the NAUTILUS have asked me to write a short article for the NAUTILUS, while I am here, on my trip to this once famous collecting ground.

Now that I am about to leave for San Francisco, I feel sorry to think that I have not devoted more time to the collection of specimens. Of course, there have been many long drives to be taken, a dip in the surf once in a day, huckle-berry expeditions with friends, and a thousand and one things to be done, while stopping at a summer watering place.

Between these "sports," if I may be permitted to call them such, I have managed to find time to do some collecting.

The hotel at which I am stopping is situated within five hundred yards of the beach. To the north, runs a very smooth beach, devoid of rocks of any character for some fourteen miles. To the south, and extending for many miles, is a very rocky stretch. To this rocky portion, almost all of my collecting trips were confined.

Monterey is no longer the famous collecting ground it used to be. The increasing population at and around Pacific Grove is driving away all the land shells. The deadly sewerage flowing from the various towns into Monterey Bay is killing the marine shells. However, new and very interesting species are occasionally brought up from deep water by the dredge.

Early in the morning, on the 28th of June, I started by steamer from San Francisco with my shell collecting outfit, consisting of glass pill bottles for small shells, paper boxes, cigar boxes, cloth bags, long, thin pieces of wood with rubber bands attached for the Chitons, alcohol stove and pan for the killing of bodies of the shells,

cotton batting, long rubber boots, an immense sun hat, a chisel to detach Haliotis shells from the rocks, etc.

I arrived here at seven in the evening and although the trip down was rough, and our little "tub" rocked dreadfully, causing me to be sea-sick, it nevertheless did not prevent me from starting right in and collecting as soon as my feet rested on terra firma. On that evening, I began collecting at seven o'clock and as it was very light at that hour, I continued to collect along the beach until eight. I am very glad I did so, as it netted me some beach-washed species which I have not come across since.

I selected a week when the early morning small low tides occurred. Thus, one morning I devoted to the collection of Haliotis cracherodii, another morning I went in search of Littorina planaxis, another for Chlorostoma costatum, Acmæa scabra, Nassa mendica, etc.

During this second week, when no morning low tides have occurred, I have gone among the rocks, gathering any and every species which was so unfortunate, nay, I should say, fortunate, as to be placed within my reach.

Priene Oregonensis Redf. will be noted as having been collected here. I do not as yet understand how this large and beautiful northern shell should be found so far south. It could not have drifted into the bay, as it was a fresh, perfect-lipped specimen.

I may also mention that in a letter recently received from Mrs. M. Burton Williamson, of University P. O., Cal., that lady informed me that *Psammobia rubro-radiata* Nutt., is not found north of San Pedro Bay. As will be noted, I found one specimen, alive and perfect. It is truly a beautiful shell. The inside of both valves resembling delicate porcelain.

I am exceedingly sorry to think that I have no dredge here with me, as I feel positive I could gather at least five times as many specimens as I have already collected.

In the following list, the number of specimens taken is given after each name, and will serve to show the relative abundance of the species.

Arionta californiensis Lea, 51 ; dupetithouarsi, Desh., 4; nicklin-iniana, Lea, 1. Acmæa asmi Midd., 33; mitra Esch., 11; patina Esch., 5; pelta Esch., 2; persona Esch., 2; scabra Nutt., 2; spectrum Nutt., 6. Amphissa corrugata Rve., 64. Astyris gausipata Gld., 12. Bittium filosum Gld., 24; filosum Gld. var. esuriens

Cpr., 2. Calliostoma annulatum Mart., 17 ; canaliculatum Mart., 32 ; costatum Mart., 80. Chlorostoma brunneum Phil., 23 ; pulligo Mart., 3 ; funebrale A. Ad., 2. Cerostoma foliatum Gmel., 1. Crucibulum spinosum Sby., 9. Crepidula edunca Sby., 21 ; rugosa Nutt., 2; navicelloides Nutt., 12. Conus californicus Hds., 4. Cryptomya californica Conr., 1. Chætopleura hartwegii Cpr., 11. Chama spinosum Sby. (?), valves only, 4. Columbella carinata Hds., 24. Drillia torosa Cpr., 5. Erato columbella Mke., 6 ; vitellina Hds., 6. Fusus luteopictus Dall, 1. Fissurella volcano Rve., 47. Gadinia reticulata Sby., 8. Glyphis aspera Esch., 3. Haliotis cracherodii Leach, 72 ; fulgens Phil., 1 ; rufescens Swains., 2. Hipponyx tumens Cpr., 57. Lyonsia californica Conr., valves only, 1. Lottia gigantea Gray, 44. Lucina californica Conr., valves only, 11. Lucapina crenulata Sby., 4. Lunatia lewisii Gld., 2. Lamellaria stearnsiana Dall, 1. Leptothyra carpenteri Pilsbry, 28. Litorina planaxis Gray, 83 ; scutulata Gld., 2. Lazaria subquadrata Cpr., 5. Mitromorpha aspera Cpr., 2. Modiola fornicata Cpr., 2. Mangilia variegata Cpr., 3. Mitra maura Swains., 1. Marginella jewettii Cpr., 25. Monoceros engonatum Conr., 2 ; lapilloides Conr., 75. Mopalia lignosa Gld., 3 ; ciliata Sby., 2. Macoma inquinata Desh., 1 ; secta Conr., valves, 2. Mytilus californicus Conr., 2. Nassa californiana Conr., 1 ; fossata Gld., 13 ; mendica Gld., 58. Nacella incessa Hds., 19 ; sp. undet., 2. Nuttallina scabra Rve., 29. Olivella biplicata Sby., 14. Ocinebra circumtexta Stearns, 7 ; interfossa Cpr., 7. Priene oregonensis Redf., 1. Psammobia rubra-radiata Nutt., 1. Pedicularia californica Newc., 12. Purpura saxicola Val., very large, 16 ; saxicola Val., var. emarginata Desh., 80. Pachypoma inæqualis Chem., 1. Phasianella compta Gld., 9. Pecten hastatus Sby., valves only, 4. Pholadidea penita Conr., 1. Placunanomia macrochisma, Desh. (valves), 2. Petricola carditoides Conr., 2. Rupellaria lamellifera Conr., 3. Saxicava arctica Linn. (valve only), 1. Scala indianorum Cpr., var. tincta Cpr., 10. Surcula carpenteriana Gabb., 3. Septifer bifurcatus Rve., 11. Standella falcata Gmel. (?) (valves only), 2. Schizothærus nuttallii Conr. (valves), 2. Tapes staminea Conr. (?), 3. Trivia californica Gray, 20. Tellina bodegensis Hds. (valves only), 2.

THE NAUTILUS.

VOL. VII. NOVEMBER, 1893. No. 7

NOTES ON PAPUINA.

BY CHARLES HEDLEY, AUSTRALIAN MUSEUM, SYDNEY, N. S. W.

All *Papuina*[1] are arboreal; this habit is as "good" a generic character as any anatomical feature could be. Parenthetically, I may remark, that my friend Mr. Brazier, who has probably gathered more living *Papuina* than any other naturalist, agrees with me that the account (Ann. Mag. N. H, (4) xx, p. 242) of a *Papuina* clinging half way up a reed in a brackish swamp is quite incredible. The usual position of *Papuina* is upon the trunks or limbs of trees where an unpracticed eye might take it for a rough bit of bark. In southern Europe the *Macularia* perch just so on precipitous rocks; indeed, I recollect there capturing an *H. niciensis* on an olive tree in exactly the manner affected by the *Papuina* in New Guinea.

A small group of Queensland snails, viz, *conscendens* Cox, *fucata* Pfeiffer, and *bidwilli* Cox, seem to differ from the main body of the genus in their habits. Not the stem or branches, but the leaves of trees are chosen by these for their favorite abode. To suit the situation the shell has been modified until the contour would suggest *Partula* rather than *Papuina*. The more conical shape has proba-

[1]This name is now generally used for the conical Helices characteristic of the Papuan and Solomon Island faunas, formerly called *Geotrochus*.

bly been adopted for greater safety in the exposed tree tops; to the same end every superfluous atom of weight has been abandoned, the shell reduced to the thinnest, and the reflected lip dispensed with. Under the lens the apex is seen to be of one and a half whorls, black or darker than the adult shell, smooth and subglobose. Oblique growth lines are the predominant features of the adult sculpture; by flashing the shell in the sunshine under a lens, an extremely minutely shagreen surface is perceptible in the gleam, and here and there broken lengths are decipherable of engraved spiral lines. Viewing the shells of these three species by transmitted light the color markings are seen as translucent spaces in the opaque shell. I should interpret these signs as indicating a descent from an ancestor like *naso* and *macgillivrayi* through a form very close to *bidwilli* Pfeiffer.

The minute almost imperceptible shagreen surface may represent the coarse sculpture of *naso;* the evanescent spiral lines are traceable from the clear cut lines of *macgillvrayi* through the fainter sculpture of *bidwilli* Pfr., to their vanishing representative in *bidwilli* Cox. But the minute subglobose apex and especially the translucent spiral color bands ally this group unmistakably with *Papuina.* Admitting this, in default of anatomical examination, it will be necessary to rename the shell hitherto known as *Bulimus bidwilli* Cox, lest it should clash with that other *Papuina* described by Pfeiffer as *Helix bidwilli.* I therefore propose that in allusion to its peculiar habits, it be henceforth called *Papuina folicola.*

Between these leaf-dwelling *Papuina* of Queensland and *Bulimus mageni* Gassies, of New Caledonia, I note a strong resemblance in color, form and sculpture, but especially in their translucent color bands. Until further research settles authoritively the position of this species I would provisionally class it with the foregoing.

SAN PEDRO AS A COLLECTING GROUND.

San Pedro, California, is remarkable for the number and variety of recent and fossil mollusks.

New forms and an unusual abundance of known species are constantly being found.

This is due in a great measure to the extension of the Government breakwater, which has made changes in the sea currents near the

shore, and caused the tide water of the harbor to scour out the channel and drift large quantities of sand over the shallows.

By this means new homes are made for wanderers, and old inhabitants are washed from their moorings and swept by the tide within reach of eager Conchologists.

It is surprising, however, how seldom the year's abundance of any species repeat themselves.

At one time *Nassa fossata* Gld., at another *Periploma discus* Stearns; at another *Lima orientalis* Cpr.; or *Scalatella striata* Cpr., are found by the dozen, or score, or hundred in San Pedro Bay or vicinity, and then for years after only a few are found at a time.

The sea conditions are unsettled. This keeps local collectors alert.

Within a few months I have found a specimen of *Tritonium gibbosum* which is new to California, and one of *Cylichna cylindracea* var. *attonsa* Cpr., which is new to San Pedro. Both shells are beach worn.

This summer I spent July at San Pedro and added a number of new specimens to my collection besides learning many interesting facts about habits and habitat of molluscs.

A student only gets a half knowledge who cannot collect specimens and study the living animals in their native haunts.

July seems to be a favorite month for many species to lay their eggs.

Mitra maura (*Idæ*), fastens her capsules to the underside of stones; the Naticidæ place their "sand collars" in the damp sand; *Bulla nebulosa* Gld. coils up her yellow strings on the grassy flats, and *Haminea virescens* Sby. chooses the same place and time, but has a different shade of yellow for her egg-strings.

I was much interested in the eggs of *Actæon* (*Rictaxis*) *punctocælatus* Cpr.

This mollusk has been rare, and I am inclined to think it only comes inshore in numbers during the breeding season and after that burrows in sand in deeper water for the rest of the year. In July we found them by the hundred.

The eggs are laid in a white string three or four inches long that coils so as to form a loose spiral.

The spirals are anchored, by some means, so firmly that the washing of rough surf does not sweep them away.

They so closely resemble the spiral pattern on the adult shell that the collector, looking down through the water, not unfrequently stoops to pick up what he thinks is one of these little gasteropods and finds a string of eggs in his fingers.

I visited Portuguese Bend and learned that *Purpura emarginata* Desh., which I found in quantity more than a year ago, is a resident or a comer and a goer, for more than a dozen were collected this summer. Its habitat is limited to a small mussel bed.

Other localities so much like this mussel bed, that one would consider them suitable dwelling places do not boast of a single Purpura; so that something besides collectors must disturb this usually common species.

I collected at San Pedro an abundance of *Acmæa paleacea* Gld. on the eel grass.

These close clingers love the grass on the outside of the island that is swept by heavy swells and where the water scarcely leaves them even in very low tides.

Their more peaceful cousins *Acmæa depicta* Gld. will probably be found swaying with the grass in the stiller waters of the bay, for dead shells have been frequently found in the drift.

In the quiet bay quantities of drift material are washed up with algæ and eel grass during medium tides.

This is rich in minute forms. It consists largely of broken shells of molluscs and crustaceans, but there is a sufficient quantity of *Pedipes, Siphodentalium, Tornatina, Cœcum, Truncatella, Mitromorpha, Turbonilla, Cerithiopsis, Triforis, Diala, Mumiola* and other wee bodies to amply repay any one for carrying away a few pounds of the drift to be dried and sorted at home.

The sifting and the sorting with a microscope takes so much time and patience, that the new and rare species hidden in my bags of drift must wait a more convenient season.

The yearly extension of sand flats at San Pedro, must make happy all sand loving species such as *Bulla, Sigaretus, Natica, Olivella* and scores of bivalves.

Besides these sandy stretches there are mud flats, rocky points, brackish water, fresh water, smooth or rocky beaches enough to make San Pedro an ideal collecting ground.

Although nearly all the localities are easy of access for the Conchologist, or the collector who "makes shell flowers," there are changes enough taking place to insure a good supply of shells.

A storm that stirs up the depths makes a grand holiday, but nearly every visit, in storm or calm, repays the student by some glimpse of the life history of some soft—hard dweller of the sea.

Sarah P. Monks.

PRELIMINARY NOTES ON TASMANIAN LAND SHELLS.

BY HENRY SUTER.

Since I became acquainted with the New Zealand and Tasmanian land and fresh water molluscan fauna, some four to five years ago. I came to the conclusion that both are very nearly related, though this opinion is not shared by Conchologists generally. On several occasions I expressed my views, especially when describing *Charopa subantialla* and *Ch. mutabilis*. It is well known that no attempt has been made to classify the Tasmanian land shells; all the Helicidæ have been simply placed in that "*olla potida*" genus *Helix*, Mr. Charles Hedley of Sydney, was first to publish structural details of the animals of some Tasmanian land shells (Proc. Linn. Soc., N. S. W. (2) VI, p. 19). Descriptions and very good figures of the animals and the dentition were there given of *Bulimus dufresni*, *B. tasmanicus*, *Anoglypta launcestonensis*, *Rhytida lampra*, *Helicarion verreauxi* and *Cystopelta petterdi*.

I have not been successful in procuring land shells with their animals from Tasmania, and I therefore decided to sacrifice part of my collection. There were some specimens with the animal dried in them and these I used for preparing the jaws and radulæ. I have just finished the microscopic slides and have not yet had time to study them carefully. However, I ascertained a few facts, which, I feel sure, may prove of great interest to Conchologists, though my communication is only provisional.

Conchologists of course know that the genera *Endodonta*, *Charopa* and *Rhytida* are common to New Zealand and Tasmania. The new facts I ascertained of genera or sections of genera found in New Zealand as well as in Tasmania, and part of Australia in some cases, are the following:

Genus **Gerontia.**

Section Flammulina, thought to be confined to New Zealand only. I think that *H. Jungermanniæ* Petterd, belongs to this section, though I am not yet quite positive.

Section *Thalassohelix*, hitherto not recorded from beyond New Zealand. There is no doubt that *H. fordei* Brazier, (=*petterdi* Cox =*positura* Cox) must be classed under this section, and very likely also *H. austrinus* Cox, *H. allporti* Cox, *H. helice* Cox, *H. medianus* Cox, *H. mixta* Cox, *H. tabescens* Cox, *H. tranquilla* Cox, *H. trajectura* Cox, which are said to be varieties of *H. fordei*. This species is found also in Australia.

Genus **Laoma.**

Section *Phrixgnathus*, a genus which was thought to be peculiar to New Zealand "par excellence." Now I am quite sure that the following Tasmanian mollusks belong to this section:

H. cæsus Cox (and var. *occultus* Cox?) *H. henryana* Petterd, and *H. pictilis* Tate; the latter being found also in Australia.

Genus **Rhenea.**[1]

This genus of which two species are known from New Zealand, is in Tasmania represented by *Hyalina nelsonensis* Brazier (=*fulgetrum* Cox, and very likely *H. dyeri* Petterd, though the dentition of the latter is unknown to me).

I am confident that on examining my slides there will be some other sections of *Gerontia* to be placed on record in my next communication on Tasmanian snails.

In future we may no doubt be able to distinguish in New Zealand and Tasmania two different immigrations of land mollusca, one having spread from north southward, and another, the *antarctic*, migrating from south to north.

Springfield Road, Christ Church, New Zealand, Sept. 6, 1893.

SOME (RESPONSIVE) REMARKS RELATIVE TO CYPRÆA GREEGORI FORD.

BY JOHN FORD.

In the note on *Cypræa Greegori* Ford, published in the October number of the NAUTILUS, the writer, Mr. Edgar A. Smith, of London, rather forcibly remarks that "the new French School of Conchologists would probably agree with Mr. Ford in considering the shell in question specifically distinct from *C. cruenta*," but, "he

[1] A genus of carnivorous, jawless snails allied to *Rhytida* and *Paryphanta*, formerly called *Elæa* Hutt. (preoc.)—*Ed.*

was glad to say that in England (and, he hoped, in America also), the ideas were not so far advanced (?)." In support of the last proposition, he says: "Although examples of this shell have been in the National (British) collection for more than fifty years, no British author has ever suggested that they belonged to a distinct species." This statement is apparently correct, but he might have added quite as truly, that nearly all of these years were required for "British authors" to find them worthy even of varietal distinction.

In view of this "state of things," it is not at all surprising that Mr. Smith should consider it a "bit of presumption" for an American student, having less than one year's knowledge of the shells, to attempt to lift them above the plane of varietal controversy.

It matters not that this student has examined hundreds of specimens, all showing the same distinctive specific characters. His "ideas" do not agree with English formulas, therefore they must necessarily be too far advanced.

Nevertheless, the new species, *C. Greegori*, has doubtless come to stay, since it has been endorsed already by quite a number of eminent (American) Conchologists, whose opinions, were it necessary to mention names, would at once be accepted as weighty. In regard to Mr. Smith's admission, "that *examples* are pretty easily separated from the *typical* form of *cruenta*," it may be said that I have seen no specimens whatever that could not be separated on sight from *any* form of *C. cruenta*. Just here, it may also be said, that I do not hesitate to claim (as in my former article) priority both for the name and description of the shell; and this claim is made in face of the fact that British authors, as a rule, command my highest respect and esteem. But while according this, I do not expect them to throttle, without ample reason, even the humblest seeker after knowledge.

It is only just to myself to say that not until my first description was in type, did I learn that Mr. Melvill had ever referred to the shells, nor, so far as I could ascertain, was this reference known to any of my Conchological friends. Indeed, the gentleman who finally gave me the information has, from the first, regarded them as *C. caurica* var. As Mr. Smith suggests, I was then, and still am, under the impression that Mr. Melvill's sentences left the reader in a state of uncertainty as to whether he considered the shells a

variety of *cruenta* or of *caurica*. That his purpose is more plainly shown in the list of figures given is apparent, but as the volume examined by me was an uncut one, this list was not at the time discovered.

Since many readers of the NAUTILUS may lack the opportunity of seeing Mr. Melvill's statement, and judging for themselves as to its clearness, it is given here *verbatim*, as follows: "*C. cruenta* (Gmel.) is very nearly allied to the preceding," [i. e. *caurica*] "and the variety *coloba* (fig. 7), so-called from the stunted appearance, is also figured in Sowb. Thes. f. 190, as *caurica var.*; it would appear nearer this species: the base is always brighter coloured, and teeth interstices bright red. I possess stunted *caurica* with which this var. cannot be mistaken."

Now if any reader of the NAUTILUS can show by these sentences to which of the two species Mr. Melvill assigned the variety, it will be a pleasure for me to acknowledge my error in questioning his meaning. But whether the language refers to one variety or another is really of very little moment at this time, since it can in no way affect the present status of the shells. Be it agreeable to Mr. Smith or not, the fact remains that Mr. Melvill's so-called description is simply meaningless and void, embracing as it does, just three words, viz, "base brighter colored," meaning, of course, brighter colored than the type shells he had in mind.

But how brighter or how colored? They are certainly *not brighter* than both *cruenta* and *caurica* usually are; and there is not a hint as to whether the *color* is green, blue, yellow or any one of a dozen hues, yet with such a description at hand, the student was expected to distinguish the shells from all others. It is true that there are other words besides the three quoted, viz, "teeth interstices bright red." Unfortunately, however, the same sentence is used in the description of the type *C. cruenta*, (to which species Mr. Smith assures us the variety *coloba* relates) and is therefore entirely worthless as a distinctive *varietal* character.

For these reasons, I claim that the name *coloba* is absolutely devoid of collateral support, since nothing can be plainer than the fact that without an accompanying description intelligible enough for comprehension, the suggested name or title of a shell is of no scientific value whatever.

But then, as Mr. Smith intimates, there is the figure! and surely that counts for *something*.

Perhaps it does. But not for anything of special importance in this connection, for Kiener, many years before, gave us a *pair* of figures quite as good; not to mention that made by Sowerby some years later.

It should be understood that these references are not made in defence of the present specific standing of the shells, but mainly in deference to those readers who may have missed seeing my former articles relating to them. The species, i. e., *C. Greegori*, is doubtless already sufficiently fortified to prevent successful assaults from any quarter.

In conclusion, it might be well to add, that Mr. Smith's rather emphatic "reminder" of my lack of courtesy, is wholly gratuitous, and therefore does not call for comment.

In the interest of peace, however, it is accepted "with thanks," and filed for future courteous consideration.

Philadelphia, October, 1893.

THE SHEEPSCOTE RIVER.

BY REV. HENRY W. WINKLEY.

The fauna of the eastern coast of New England, aside from the species which characterize it as a whole, has a number of small areas where the oyster, quahog and other southern forms exist. The most conspicuous of these areas is Northumberland Straits, where the oyster is abundant enough to be of commercial value. Other points, where the Virginian fauna occurs, are a few sheltered spots on the east coast of Nova Scotia, in Minas Basin, Casco Bay and Massachusetts Bay, with a few outliers of less importance.

These spots on the coast are widely separated from each other, and have in the near neighborhood animals which are adapted to the colder waters. Some few years ago the present writer published a list of thirty species found in Northumberland Straits.[1] The present summer was spent in Wiscasset, Maine; this and a visit to that place three years ago enabled me to dredge in many places in the Sheepscote River.

Wiscasset is ten or twelve miles from the sea and the river is practically a salt water bay or fjord. Its depth is ten fathoms in

[1] Bulletin VII—Nat. Hist. Soc. of New Brunswick.

places, and at no point is it shallow. The width, on the other hand, is but a few hundred yards except at Wiscasset, where it is three quarters of a mile wide. The river is famous for its scallops, *Pecten magellanicus* Gmelin, these occur for the most part in the lower part of the river.

It was frequently reported to me that oysters were to be found "up river" four or five miles. I am sorry to say I had but one day "up river;" that trip, however, revealed the fact that a very narrow spot known as the Falls, separated an upper basin from the main part of the river. Here in the warmer waters oysters do occur, but very few and far between. With the oysters I found a few of the old companions noticed in Northumberland Straits, and abounding south of Cape Cod.

As a whole this river is rich in specimens, and the cold and warm water species are by no means distant neighbors. Some forms are dwarfed, some like *Bullinella alba*, are colored probably by iron to a darker shade than the normal. I believe that more species may be added to the list by a more careful search above the place dredged. I give the list of those found by me in the area extending four or five miles each way from Wiscassett.

Mya arenaria Linn.
Pandora gouldiana Dall.
Lyonsia hyalina Conrad.
Saxicava rugosa Lam.
Macoma baltica var. fusca Say.
Cryptodon gouldii Stimp.
Astarte undata Gld.
Gemma gemma var. totteni Stm.
Cardium pinnulatum Conrad.
Venericardia borealis Conrad.
Nucula proxima Say.
Nucula dolphinodonta Migh.
Yoldia sapotilla Gld.
Mytilus edulis Linn.
Modiola modiolus Linn.
Modiola plicatula Lam.
Modiolaria nigra Gray.
" discors Linn.
Crenella glandula Stimp.
Pecten magellanicus Gmelin.
Ostrea virginiana Gmel.
Anomia simplex Orbigny?
" aculeata Gmel.
Diaphana debilis Gld.
Utriculus gouldii Stimp.
Bullinella alba Brown.
Chiton marmoreus O. Fab.
Chiton albus Mont.
Acmæa testudinalis Mull.
Puncturella noachina Linn.
Skenea planorbis Fabr.
Cingula minuta Totten.
Onoba aculeus Gld.
Lacuna vincta Mont.
Litorina tenebrosa Mont.
" litorea Linn.
" palliata Say.
Odontostomia bisuturalis Say.
Odontostomia trifida Totten.

Velutina haliotoidea Stimp.
" zonata Gld.
Polynices heros Say.
" triseriata Say.
Bela incisula Verr.
" harpularia Couth.
" cancellata Migh. & Ad.
" decussata Couth.
Purpura lapillus Linn.
Ilyanassa obsoleta Say.
Nassa trivittata Say.
Buccinum undatum Linn.
Chrysodomus stimpsoni Mörch.
Chrysodomus pygmæus Gld.
Trichotropis borealis Sby.

[Communicated.]

AMERICAN ASSOCIATION OF CONCHOLOGISTS.

The President of the Association regrets that he has been compelled through stress of business engagements and other matters, to temporarily suspend his correspondence upon Conchological matters, but would be glad now to hear from any of the members, especially those whose letters have not be attended to promptly.

The Association has recently not been so active as formerly, but everything looks fair for a go-ahead, prosperous season. Nearly 200 members are enrolled in the Association, and any proposals of new members will be acted upon promptly by the officers. Such proposals should be made to the Secretary, Mr. Chas. W. Johnson, Wagner Institute, Philadelphia.

Members desiring to forward fine specimens of shells to the "American Collection," will kindly communicate with the President, Mr. John H. Campbell, 1009 Walnut Street, Philadelphia, sending him lists of such species as they wish to forward. Due acknowledgment of shells received will be made in the pages of the "Nautilus."

The most recent addition to the collection has been a fine series of fossil species from the Miocene and Pliocene of Maryland, Virginia, North Carolina and Florida by Mr. Joseph Willcox of Philadelphia. The collection, already, is one of the finest "special collections" in America, and bids fair to surpass all others. Each species is carefully examined, named, mounted and placed in the cases set apart by the Academy of Natural Sciences and the collection as a whole, is kept separate from the general collection of that

institution. The *name* and *address* of each donor with date of reception, are neatly written on the cards, upon which the shells are mounted and the officers of the Association give the collection their personal supervision.

Changes of address of members should be promptly noted to the Secretary.

NOTES AND NOTICES.

Mr. F. H. Lattin, whose Natural History establishment at Albion, N. Y., has long been well known to many of us, has recently founded a "branch" in Chicago, where we lately had the pleasure of looking through his large mass of material. Mr. Lattin has now a considerable stock of shells in addition to his departments of ornithology and oology, and it is with pleasure that we announce this first commercial enterprise in the Conchological line in the West. F. H. Lattin & Co. now occupy a handsome and well filled building at 3571 Cottage Grove Avenue.

A VIGOROUS EDITORIAL from the pen of Mr. J. Ritchie, Jr., dealing with the recent postal ruling against natural history specimens, appeared in the *Commonwealth* (Boston), Saturday, September 23.

VARIATIONS OF STROBILOPS HUBBARDI.—In looking over our collection of this species I find that over half of them have three teeth, but about a third have four, and I found one with five. We have collected them from several different localities, but all in Florida, and nearly all in this county, some near the coast and some 16 to 18 miles inland.—*G. W. Webster, Lake Helen, Florida.*

A SYNONYM OF LEPTOTHYRA.—It seems to have escaped notice hitherto that Gabb's genus *Petropoma* (Journ. Acad. Nat. Sci., Phila. viii, p. 281) is founded upon a species exhibiting all the essential features of *Leptothyra*. The operculum and shell are very like in structure to the granulose species of the central Pacific. Gabb, in his description, mistakes the inside for the outside of the operculum. Being later in date than *Leptothyra*, the name *Petropoma* becomes a synonym.—*H. A. P.*

THE NAUTILUS.

VOL. VII. DECEMBER, 1893. No. 8

LAND AND FRESH WATER SHELLS IN THE ROCKY MOUNTAINS.

BY GEO. W. TAYLOR, VICTORIA, B. C.

In the October NAUTILUS there is a short paper by my friend Mr. Hanham upon the shells found by himself during a trip in that rather out of the way Canadian locality, the Gaspé region.

It may be interesting to have a record of a small collection made by me a few weeks ago in another little-known locality at the opposite end of the Dominion viz.: Laggan near the summit of the Rocky Mountains.

I had received earlier in the year from Mr. T. R. Bean of Laggan, a nice little collection of shells which included specimens of what Dr. Sterki considers to be the true *Pupa hoppii* of Möller, and this tempted me to stay over for a couple of days when passing through Laggan last September on my way to Toronto.

Dr. Bean most kindly showed me all the best localities known to him, and our united exertions were rewarded by the discovery of several species that he had not previously recognized, including one which I believe had not before been found in Canada.

In the rivers, the Bow and the Pipestone, we could not find any shells at all, the waters being cold and the stream rapid in each case, but in all the little creeks and swamps *Limnæa palustris* abounded and *Planorbis parvus* occurred in less numbers. In a small lake not more than a mile from Laggan we found, in addition to the

species above named, 3 others—*Planorbis trivolvis* Say, common, *Pisidium abditum* Hald., rare, and a *Valvata*, which I suppose to be *virens* Tryon, 6 specimens only.

No *Physa* of any kind were observed, nor has Dr. Bean as yet found any species of *Unio, Anodonta,* or *Sphærium.*

The land shells enumerated below were all found under logs or under pieces of board in the neighborhood of the settlement and along the banks of the rivers. *Vitrina limpida* Gould, *Hyalina arborea* Say, *Hyalina radiatula* Alder, *Conulus fulvus* Drap., *Patula striatella* Anth., *Vallonia costata* Müll. (form *gracilicosta* Reinh., teste Sterki), *Ferussacia subcylindrica* Linn., *Succinea avara* Say, and a species of *Vertigo* closely resembling *gouldii*, were all common.

Pupa hoppii Möller, was not very common in the spots I searched and I only secured 8 specimens. Still less frequent was *Pupa alticola* Ingersoll, which I had here the pleasure of finding for the first time.

Dr. Bean has in his collection, besides the above, specimens of *Pupa pentodon* Say, which he took a few miles to the west of Laggan; and a second species of *Succinea* perhaps *S. ovalis* Gould. Lastly some slugs which were probably *Limax hyperboreus* West., were observed by us but not collected.

The altitude of Laggan is about 5,200 feet above sea level and the locality is interesting, as being nearly at the summit of the Rocky Mountain range, which seems to form, in Canada, a hard and fast line of demarcation between the eastern and western species of Mollusca.

HÆCKEL'S PLANKTONIC STUDIES.

All interested in the life of the open and deep sea, the so-called pelagic or Plankton fauna, will be interested to read the translation of Prof. E. Hæckel's paper of 1890, which is printed in the Report of the U. S. Fish Commission for 1889–91, pp. 565–641.

Some of the German polemics are omitted, though a sufficient amount remains to spice the article in a lively manner. There is much reason to believe that Hæckel, who has had no experience in deep sea work, has overestimated the evidence in favor of zonary distribution of life in the deep sea. Certainly the observations of

Agassiz and Tanner are superior by reason of their better apparatus to any heretofore made, and they seem to show that with the exception of a superficial zone of a few hundred fathoms and a thin zone immediately over the bottom, the animal kingdom is represented in the intervening region by the dead bodies of sinking animals only, and has no peculiar fauna of its own and but little life. There is no obvious reason why this must be so, but the most carefully checked observations yet made indicate that it is so. Apart from this one point, the paper of Haeckel gives a most interesting, accurate and vivid idea of the pelagic life of the sea, and one which every one may read with profit. The vast experience in surface and coast collecting which the Jena Professor has had, enables him to speak from experience in this direction, and the material obtained by others, on the Challenger and elsewhere, which he has worked up, has given him great familiarity with the Plankton fauna.

W. H. D.

CONTRIBUTIONS TOWARD A REVISION OF THE TASMANIAN LAND MOLLUSCA.

BY H. SUTER.

Since I wrote the "Preliminary Notes on Tasmanian Land Shells," I have sacrificed many more specimens of my collection for the study of the dentition, and, as I have just finished the work, I wish to give here the result of my investigations.

Before giving the results of my study, it will be necessary to say a few words on the classification of the New Zealand Helicidæ. Mr. H. A. Pilsbry proposed (NAUTILUS, VI, 1892, No. 5, pp. 54–57) a new classification of N. Z. Helicidæ, the main feature of it being the forming of one genus, *Gerontia*, of these former genera constituting my family *Phenacohelicida*. Later on he published (Proc. Acad. Nat. Sci. Philada., 1892, pp. 387, etc.) a "Preliminary Outline of a New Classification of the Helices," in which he included under the one genus *Endodonta*, the following groups: *Endodonta* s. str., *Ptychodon* (= *Maoriana*), *Charopa*, and his genus *Gerontia*. I can not agree with this latter classification, as the author was under the impression that *Endodonta*, *Charopa*, etc., possess a muc-

ous tail gland, which is not the case. Moreover, the jaw in *Endodonta* and *Charopa* is only striated, whilst stegognath in *Gerontia*, and the radula in the latter is more or less distinctly pseudozonitoid. I am of opinion that the separation of *Gerontia* from *Endodonta* is fully justified; the patuloid shells being included in *Endodonta*, whilst the more zonitoid forms are embraced in *Gerontia*.

Mr. Charles Hedley and the writer substituted von Martens' *Flammulina* for *Amphidoxa* of N. Z. authors, and as the genus of von Martens dates from 1873, it must be used as the generic name instead of *Gerontia* (1883).

The classification of the New Zealand Helicidæ I propose, following chiefly Mr. H. A. Pilsbry, is the following:

Group Haplogona Pilsbry.

1. Genus *Flammulina* (von Martens) Suter.

Sections: (1) *Flammulina* v. Mart. s. str.; (2) *Gerontia* Hutt.; (3) *Phacussa* Hutt.; (4) *Therasia* Hutt.; (5) *Pyrrha* Hutt.; (6) *Phenacohelix* Sut.; (7) *Allodiscus* Pils.; (8) *Suteria* Pils.; (9) *Thalassohelix* Pils.

2. Genus *Endodonta* (Albers) Pilsbry.

Sections: (1) *Endodonta* Albers,' s. str.; subsect. *Ptychodon* Ancey; (2) *Charopa* Albers; subsections, a. *Tesseraria* Bottger; b. *Aeschrodomus* Pils.

Group Polyplacognatha Pilsbry.

Genus *Laoma* (Gray) Pilsbry.

Sections: (1) *Laoma* Gray, s. str.; (2) *Phrixgnathus* Hutton.

Giving now the classification of the Tasmanian land shells examined, I wish to point out that it is based on the dentition as well as on the shell characters; their number is thirty-two.

Genus *Flammulina* (von Mart.) Suter.

Sect. *Flammulina* von Martens, s. str.

(1) F. jungermanniae Petterd.
(2) F. sitiens Cox.
(3) F. luckmani Brazier.

Sect. *Gerontia* Hutton.

(1) G. albanensis Cox.
(2) G. stanleyensis Petterd.
(3) G. legrandi Cox.
(4) G. marchiannae Cox.
(5) G. diemenensis Cox.
(6) G. gadensis Cox.
(7) G. tasmaniae Cox.
(8) G. subrugosa Brazier.
(9) G. mathiunæ Petterd.
(10) G. macdonaldi Cox.
(11) G. bassi Brazier.
(12) G. tamarensis Petterd.

Sect. *Phacussa* Hutton.

(1) Ph. savesi Petterd.
(2) Ph. stephensi Cox.
(3) Ph. Hamiltoni Cox.

Sect. *Allodiscus* Pilsbry.

(1) A. limula Cox.

Sect. *Thalassohelix* Pilsbry.

(1) Th. fordei Brazier.

Genus *Endodonta* (Albers) Pilsbry.

Sect. *Charopa* Albers.

(1) Ch. antialba Beddome.

Genus *Laoma* (Gray) Pilsbry.

Sect. *Phrixgnathus* Hutton.

(1) Ph. weldii Tenison-Wood.
(2) Ph. caesus Cox.
(3) Ph. henryana Petterd.
(4) Ph. furneauxensis Petterd.
(5) Ph. pictilis Tate.
(6) Ph. pipænsis Petterd.
(7) Ph. halli Cox.
(8) Ph. hobarti Cox.

Genus *Rhytida* Albers.

(1) R. sinclairi Pfeiffer.
(2) R. ruga Cox.

Genus *Rhenea* Hutton.

(1) R. nelsonensis Brazier.

It is a most astonishing fact how close the relation between the Tasmanian and New Zealand molluscan fauna really is, more so than I ever expected it to be. Of nine sections of the genus Flam-

mulina occurring in New Zealand, five are represented in Tasmania. Most remarkable is the preponderance of *Gerontia*, a section represented in New Zealand by two species only, and of *Phrixgnathus*, which is also well represented in New Zealand. A very striking feature is the almost total absence of *Endodonta*, there being one species of *Endodonta* s. str. (*E. dispar* Braz.) and one of *Charopa* known from Tasmania. *Rhytida* is more abundant in Tasmania, whilst *Rhenea* is represented by two species in each country.

There can be no doubt about the great antiquity of these forms, as they must date at least from the Cretaceous period.

New Zealand, Christchurch, October 4, 1893.

IN MEMORIAM—ROBERT WALTON.

It is with sad hearts that we record the death of our young friend Robert Walton. While out collecting on Saturday, November 11, along the steep bank at West Conshohocken, he slipped and fell as a freight train was passing below, receiving a terrible gash on the head and having one of his legs crushed beneath the wheels, from which he died at 8 P. M., the accident occurring about noon. He was born in Halifax, England, July 17, 1875, and came to this country in the summer of 1889. He was a collector from boyhood, studying nature with that enthusiasm which only a born naturalist can. He was not content with a collection of shells alone; his was a collection of the mollusca. He studied their anatomy, working out their jaws and dentition, the darts from the *Zonites*, and the testaceous shell-plates, from the *Limaces*. He was a close observer, and by his zealous collecting he found many forms not before recorded from this section. Among his rarities were reversed specimens of *Zonites cellarius* and *Zonites ligerus*, and I remember his saying, when we met only a few days before his sad accident, that he found the reversed *Zonites cellarius* at West Conshohocken. He was to be appointed as a Jessup student at the Academy of Natural Sciences, and was looking forward, as only a young heart can, to the day when he would be studying and working there among the objects he so dearly loved. Mr. Pilsbry was looking forward with a great deal of pleasure to the time when he would have such a valuable

assistant. We shall miss him with his bright and happy face and his pocket full of shells, and all tender our heartfelt sympathy to his parents and brothers.

The appended lines are by his friend, Mr. John Ford.

C. W. J.

Toll, toll the bell! his young heart beats no more;
His eyes are dimmed, his life's short cycle run.
No more may Science yield him, as before,
The charming favors he so fairly won.

Alas, that in the East his sun should set,
And 'neath the shadows hide the hopes he knew!
Bright hopes, recalled to mind with keen regret
By all who felt his power to will and do.

Though now in sorrow we must say "Farewell!"
Sweet memories of him our hearts will hold;
While through the years that Time for us may tell
His friendship shall be cherished as of old.

A NEW HAND-BOOK OF THE HELICES.[1]

This new work, of which the first one of the four parts has now appeared, aims to present a complete introduction, key and index to the genera, subgenera and species, of the Helices of the world. Each group, whether generic, subgeneric or sectional, is defined, and its species enumerated; the type and usually a number of prominent species of each is figured, and the anatomy is described and figured.

The first genus included in the "part" just issued, is *Trochomorpha*, an important Asiatic and Polynesian group, many specimens of which are in most collections. Although it has generally been associated with the Helicidæ, *Trochomorpha* really belongs to the Zonitidæ; and it is admitted to this work only because the species have been generally known as "*Helix*."

[1] By H. A. Pilsbry; being Vol. IX of the Manual of Conchology. Published by the Conchological Section of the Academy of Natural Sciences of Philadelphia. 8 vo. Issued in parts, price $3.00 per part, plain edition; or $5.00 per part colored edition. Any volume complete in itself, and sold separately.

The following genera belong to the Helicoid group *Haplogona*.[2] They have a shell with simple, non-reflexed lip, more or less similar to our "*Patula*" *alternata*, etc. The genital system lacks all appendages. *The foot has on each side a border above the margin bounded by a groove* (easily seen in *alternata*, *solitaria*, etc.). This last character is shared with the family *Zonitidæ*. The jaw exhibits considerable variety in the several genera. It is either (1) composed of separate squarish plates, overlapping or imbricating, and only connected by a common membrane (*Punctum*, *Laoma*), or (2) the plates are soldered together, the outer edge of each being free (*Flammulina*, *Charopa*), or (3) the plates are completely soldered together, their edges appearing only as vertical striæ (*Pyramidula*="*Patula*"). The first type has been called *Goniognathous*, but falsely, as it has no near relationship to the jaw of *Orthalicus*, etc.; the second type has been called *Stegognathous* or "plaited"; and the third *Aulacognathous* or "striated." The three are really only stages of development, and between the last two all intermediate forms occur.

The principal peculiarity of the generative system, besides its simplicity, is the very low insertion of the spermatheca duct. The teeth show no very characteristic features, except that in many cases the inner cusp is retained on the laterals, as in the *Pupidæ*.

The genera of *Haplogona* may be briefly tabulated thus:

a. Jaw composed of separate plates, *Punctum*, *Laoma*.
aa. Plates of jaw more or less soldered together,
b. Tail having a mucous pore, *Flammulina*.
bb. No mucous pore
c. Australo-Polynesian forms, *Endodonta*.
cc. S. American forms, *Amphidoxa*.
ccc. S. African forms, *Phasis*.
cccc. North temperate forms, *Pyramidula*.

The five last named genera include a great number of subgenera and "sections," all of which are defined and fully illustrated both as to shells and anatomy, with lists of the species of each.

The group *Haplogona* as a whole may be regarded as an ancient and unspecialized type, formerly world wide in distribution. At present a vast majority of the species retain their footing only on the southern extremes of the three great land masses of the globe, and

[2] The genus *Polygyra*, formerly included in the *Haplogona*, does not belong there. It has a solid, ribbed jaw and no grooves above the foot margin.

on the Pacific Islands, where they are free from the competition of highly organized types of Helix, which have driven them from the Tropics and North Temperate regions. In the north the species are comparatively few in numbers, and live mainly in the colder latitudes, where more recent types of Helix do not flourish, or in some cases they have become reduced in size as in the sections *Helicodiscus*, *Pyramidula s. str.*, *Planogyra*, *Patulastra*, etc., acquiring the habits of the *Pupæ* with which they compete, and in many cases the *Pupa* type of dentition also.

The name *Pyramidula* Fitz. 1833, has been preferred to that of *Patula* Held. 1837, for the Eur-American group to which *H. rotundata* and *alternata* belong, on the ground of prior publication, and because two other names for the group were proposed in 1837, either of which has as much claim to be accepted as *Patula*. There are moreover, still two more names antedating *Patula*, besides the earliest name, *Pyramidula*. This change is therefore inevitable.

The figures were mostly drawn by the author. They illustrate prominent typical species of all the subgenera and sections; so that it is comparatively easy for a person unacquainted with the intricacies of Helix classification to refer any specimen to its appropriate group, whether it be a living or fossil form.

NOTES AND NEWS.

In a recent letter from Miss Ida M. Shepard, she says: "We have formed what we call the Los Angeles Conchological Club, for the study of our local shells, and hope to take up the west coast species generally later. We have eleven members, and meet once or twice a month." We heartily endorse this new organization for the study of the mollusca, and wish the club a successful future.—*C. W. J.*

Species Determined.—From M. M. Schepman, Rhon near Rotterdam, Holland, 1. *Sistrum nodulosum* C. B. Ads.; 2. *Bittium* sp.; 3. *Carditamera gracilis* Shuttl.; 4, 5. *Acmaea cubensis* Reeve; 6. *Acmaea leucopleura* Gmel.; 7. *Donax fossor* Say; 8. *Heterodonax bimaculatus, L.*; 9. *Litiopa bombyx Kien.*; 10, 11. *Mytilus exustus* Linn.—*C. W. J.*

Valloni a americana Ancey *ms.*—The description of this has been published by Dr. Sterki in Proc. Acad. Nat. Sci. Phila., 1893, p. 266. The locality of Ancey's types, however, is not stated, so it seems desirable to record that they were from Davenport, Iowa, collected by Professor D. S. Sheldon. *V. parvula*, it will be noticed, is recorded by Sterki from the same locality. It may be added that I saw Ancey's MS. description in May, 1890.—*T. D. A. Cockerell.*

Strobila hubbardi.—Noting your comments on *S. labyrinthica* and vars., suggested to me the idea of comparing them with *S. hubbardi*.

There is evidently a close affinity between the two species, and the same tendency to variation in the number of teeth. I find in the *Hubbardi* three constant teeth, but in nearly one-half of our collection of several hundred there is an extra tooth between the second and third tooth counting from the umbilicus, and in some cases a fifth tooth beyond the third. The variety *S. strebeli* found here in our locality is also an approach to *S. hubbardi* in its depressed spire and dark color. They are also found in similar stations often together under the bark of old logs or on palmetto trees, hidden in dirt or old rubbish. *Hubbardi* is a very shy snail, and I have spent many days looking for them. At first I thought three or four a good day's find.—*G. W. Webster.*

Vitrina limpida in Pennsylvania.—In my note on *Vitrina limpida* Gld. in Pennsylvania which you published in the August Nautilus, I promised to report the results of future visits to the place where the shells were found. I went down yesterday afternoon and found 24 *living shells*, and as I could only go over a very small portion of the hollow, owing to a *very heavy* growth of nettles, brambles and other noxious weeds, I think the shells must be very plenty—in fact, I do not think I "worked" over two or three square yards at the most. * * * *

In continuation of my letter of October 2: On the 8th inst. I again visited the place where I found the *Vitrina limpida* Gld., and got 38 living specimens in about one and one-half hours, and went over exactly the *same ground* as in my former visit, though this time the space worked over was less than on October 1. The colony appears to be in a very flourishing condition, although dead shells are very plenty. * * * *

Since writing you last, I have collected 208 living *Vitrina limpida* Gld. The last time I was out, a friend and myself collected 70 *in an hour*, and only took the *largest* specimens.

—*Geo. H. Clapp, Pittsburg, Pa.*

On Land and Fresh Water Mollusca of Lower California, by Dr. J. G. Cooper (Calif'a Acad. Sci. III). In this paper several very interesting species are described and figured. Among them are two species referred to *Columna*, a *Melaniella*, two *Planorbis* allied to *P. exacutus* Orb., and a sub-species of *Helicodiscus lineatus*.

The Isaac Lea Chapter of the Agassiz Association is becoming an important factor in the revival of interest in American conchology. The President is now Prof. Josiah Keep; the General Secretary Mrs. M. Burton Williamson (University, Los Angeles Co., Cal.). Interesting reports of their work are published by the Secretary in *Popular Science News* from month to month.

A valuable paper on the anatomy of *Bulimus acutus*, by Messrs. W. Moss and F. Paulden, appears in the Trans. Manchester Micros. Soc. for 1892.

The First Meeting of the Winter Session of the Perthshire (Scotland) Society of Natural Science was held at Perth, Nov. 9, Mr. Henry Coates, President, in the chair. In his opening address the President gave his impressions of the principal Scientific Museums of America, which he had visited during the Summer. The criticisms seem for the most part appreciative and just, and are of interest to us as showing how our work appears in the eyes of a cultured observer familiar with English museum methods.

Dr. Wm. H. Dall has left Washington to investigate geological problems in South Georgia and Florida.

Messrs. Henderson and Simpson, of Washington, have departed on a winter tour in the West Indies, especially Jamaica. They will no doubt return with a rich store of conchological plunder from this paradise of mollusks.

Acanthochites exquisitus Pilsbry.—The locality given in a former number of the Nautilus for this species is incorrect. I am informed by Dr. R. E. C. Stearns that Mr. Lockington procured his

specimens of this and other Lower California mollusks from Dr. W. J. Fisher, who fitted out a vessel at his own expense. He collected this species at Los Animas Bay.—*H. A. P.*

NEW PUBLICATIONS.

Natural History Notes from North Carolina, by A. G. Wetherby. From the Jour. Cincinnati Soc. Nat. Hist. An interesting article strongly criticizing the present mania for species-making with notes on the *Mesodon* of Roan Mountain and vicinity.

—*C. W. J.*

Report on the Mollusk-Fauna of the Galapagos Islands, by R. E. C. Stearns, Ph. D., from the Proc. U. S. Nat. Mus., Vol. XVI. The geographical and physical characteristics of the Islands are thoroughly discussed, and with the amount of material at his command, Dr. Stearns finds that the many so-called species of *Bulimulus* are only forms of *B. nux* "for this is one of those protean forms, like, for instance, *Patula strigosa, cooperi,* etc., that can not be properly exemplified or understood by a few examples, nor even by a hundred specimens."—*C. W. J.*

An able article by Mr. Chas. T. Simpson, On some Fossil Unios and other Freshwater Shells from the drift at Toronto, Canada, with a review of the distribution of the *Unionidæ* of northeastern North America, appears in the Proc. U. S. Nat. Mus., Vol. XVI.—*C. W. J.*

Observations on Vallonia, by Dr. V. Sterki from the Proc. Acad. Nat. Sci., Phila., 1893. In this article Dr. Sterki has, with his accustomed acumen, revised the species and varieties of this genus of minute Helices, illustrating the shells, dentition and jaws of the species. The group has been much neglected heretofore; and while some Conchologists may not be prepared to accept so many species as Dr. Sterki distinguishes, it must be everywhere admitted that in pointing out the distinctive features of the forms, a very valuable service has been rendered, and a substantial addition made to conchological literature.—*H. P.*

SWORD, PHILA., ENGR.

1. M. LINTOIDEA.
2. C. DALLI.
5. C. SERRATOIDES.
2. C. DALLI.
4. M. BURNSII.
4. M. BURNSII.
3. P. CLARKEANA.
6. L. INDISTINCTUS.

ALDRICH—NEW TERTIARY FOSSILS.

THE NAUTILUS.

VOL. VII. JANUARY, 1894. No. 9.

NEW TERTIARY FOSSILS FROM RED BLUFF, MISSISSIPPI.

BY T. H. ALDRICH.

The fossil-bearing stratum designated by Dr. E. W. Hilgard as the "Red Bluff group," occurs in Wayne County, Mississippi, near Red Bluff station, and is exposed on the banks of the Chickasawharg River. The fossiliferous stratum is four feet thick and contains beautifully preserved specimens imbedded in a greenish clay. Through the kindness of Prof. W. H. Dall I have had an opportunity to examine the collections of the National Museum, which were obtained here by Mr. F. Burns and others and with a series in my own cabinet have been enabled to list 135 species from this bed. Of these 26 are peculiar; 25 are found also in the beds at Jackson, Miss.; 54 occur also at Vicksburg, and 30 are also common to Jackson and Vicksburg. This bed, therefore, should be classed with the Vicksburg series. The following are described as new:

Mitra lintoidea n. sp. Pl. 4, fig. 1.

Shell fusiform, whorls nine, somewhat turrited, densely but coarsely longitudinally ribbed, a transverse impressed line behind the suture gives the upper whorls the appearance of being beaded; aperture narrow, elongate; outer lip sharp, slightly incurved, striated within, labium four plaited; canal open, rather short, curved, a number of impressed lines showing upon the lower part of body whorl. Alt. 27 mm.; diam. 8 mm.

This species differs from *Fusimitra cellulifera* Con. by its lack of

impressed revolving punctures and by being broader and much heavier.

The ribs are almost obsolete in young specimens. Type is in my collection. Examples in National Museum.

Cypræa Dalli n. sp. Pl. 4, fig. 2. 2 a.

Shell ovate, moderately elevated, surface highly polished, crossed above by a number of lines not closely set, dividing the surface into a series of facets, base ventricose; labrum very much thickened, profoundly striated but the striations do not extend up over the whole surface. Teeth on outer lip alternate. The smaller ones half the length of the others; aperture narrowed in some specimens in the centre, in others regular and strongly denticulated. Length 15 mm.; width 12 mm.; alt. 9 mm.

This shell is also found at Jackson, Miss. It resembles *C. lintea* Con., and has been considered as that species. It is however larger, with a more thickened labrum on which the striations do not reach the body of the shell as in Conrad's species, but stop half way; the surface of this shell is very different. In *C. lintea* the surface is completely covered with close-set, very fine lines, while this species has but few, and they are not impressed, some specimens being smooth. The type retains some color, showing the shell to be chocolate brown above with the lip white; *C. lintea* Con. is figured in my *Preliminary Report*, Pl. V, fig. 2, p. 32, 1886.

Conrad's original description contains a misprint which seems to have been perpetuated in later publications. It should read "with *fine* approximate equal impressed lines," instead of "*four* . . lines." Type in National Museum; examples in my collection.

Pleurotoma Clarkeana n. sp. Pl. 4, fig. 3.

Shell rather solid, fusiform, whorls about nine, spire smooth (?), whorls with about eleven strongly raised and rounded ribs crossed by coarse revolving lines; somewhat alternate. The finer lines between often being double, especially upon the body whorl. Suture appressed, bordered by a corded thread, and this in turn by a concave space. Aperture oblong-oval. Canal short. Sinus semicircular, and well up in the aperture. Length 31 mm.; breadth 11 mm.

Murex (Pteronotus) Burnsii n. sp. Pl. 4, fig. 4, 4a.

Shell large, with three foliated varices, whorls nine. Nucleus pointed, smooth; whorls convex, appressed at suture, whorls fol-

lowing the nucleus have two ribs on centre, each rib bearing a node which is equidistant from the foliations; three continuous fin-like varices continued from apex, which revolve in descending, edges of varices dentate. Body whorl with about thirteen distant spiral raised ribs, the two on the periphery bearing a node each between the foliations. Aperture elongate-oval. Outer lip having internally seven plications, inner lip smooth; canal rather long, almost closed posteriorly, widening anteriorly, and bent upwards. Canal of preceding aperture persistent. Alt. 65 mm.; diam. 33 mm.

This elegant Pteronotus is described from the unique example belonging to the National Museum. Named in honor of its discoverer, Mr. F. Burns, of the U. S. National Museum.

Cerithium serratoides n. sp. Pl. 4, fig. 5.

Shell elongate; suture linear; whorls ornamented with transverse ribs, which are moderate near the suture, but suddenly become enlarged and spinous at the intersection of a spiral near the middle of each whorl; a couple of fine spiral lines occur between the spines and preceding whorl; also a single spiral line just below the suture. Whorls slightly shouldered.

Specimen figured has lost its apex and aperture, but is so evidently a serrate Cerithium that I have concluded to describe it.

Length of part figured is 36 mm.

Type in National Museum. Example in my cabinet.

Latirus indistinctus n. sp. Pl. 4, fig. 6.

Shell fusiform, whorls nine, rounded; apical whorl smooth, the remaining ones transversely ribbed, crossed by raised lines that on the body whorl are alternately coarse and fine; suture distinct, whorls appressed to it anteriorly. Canal long, twisted strongly to the right and then to the left. Striations continue to the end of canal. Aperture oblong-oval, toothed posteriorly and shouldered anteriorly. Outer lip striated internally; inner lip covered with a thin callus, definitely delineated and running to end of canal. No teeth on the inner lip, but some of the striations show through the callus. Alt. 42 mm.; diam. 14 mm.

This handsome species is strongly Fusoid in appearance, and does not possess plications on the inner lip like most of the genus, but it evidently belongs there from its other characters.

Type in the National Museum. One example in my collection.

NOTES OF A COLLECTING TRIP TO DEPARTURE BAY, VANCOUVER ISLAND.

BY GEORGE W. TAYLOR.

The account given by Mr. Wood in the October number of THE NAUTILUS of his collecting trip to Monterey Bay tempts me to put on record an experience of my own which goes to prove that our Northern waters are quite as rich in molluscan life as those of the sunnier South.

Departure Bay is a small bay on the east coast of Vancouver Island, about 75 miles north of Victoria. It is shut in by its own shores on the north, west, and south, and is protected from the open sea on the east by a series of small islands. Consequently, the water, at most seasons of the year, is smooth, and as the depth ranges from 10 to 50 fathoms, and the bottom is varied, being sandy in some places and rocky in others, the bay is a capital place for a dredging expedition.

In August, 1888, through the kindness of Mr. S. M. Robins, the managing director of the New Vancouver Coal Company, I was able to spend four days in dredging from a small steam launch belonging to the Colliery Company. Much time was wasted on this occasion in searching for suitable ground, but the result of the four days' work was by no means disappointing, as I took home with me more than five thousand (5,000) specimens of one hundred and ten different species. One of them, since named in manuscript by Mr. Whiteaves as *Pecten Vancouverensis*, was new to science, and several others were additions to our Vancouver lists.

In July of the present year, I spent three and one-half days in the same locality in company with Professor Macown, the well-known Canadian botanist and naturalist. We were determined, if possible, to beat the previous record, and therefore worked very industriously. We spent two and one-half days collecting on shore between tide marks, and one day was devoted to dredging over the ground prospected in 1888.

In the shore collecting my own captures amounted to nearly 2,500 shells of 61 species. In the dredging expedition our joint bag reached the grand total of over seven thousand (7,000) specimens of 88 species. This very satisfactory result was obtained from an ordi-

nary open sailing boat, with a crew of three men and a single home-made dredge. I should mention that 13 species were taken both between tides and by dredging, so that the actual number of different species taken in the three and one-half days was 136.

In shore collecting, no attempt was made to collect the very common shells in quantity, or the numbers might have been swelled indefinitely. In fact, I was looking more especially for Chitons, of which I took seven species (183 specimens), and the smaller shells, such as *Volutella pyriformis* Cpr. (40 specimens), and species of *Odostomia*, which occurs commonly under rocks at low water. I took also on this occasion a very fine series of *Terebratella transversa* Sby., which was found literally in thousands attached to the rocks on the south side of the bay.

Fine series of several *Macomas* were dug in the sand, and a few specimens of the curious *Lepton rude* Whiteaves were found attached (as is their habit) to the central segments of specimens of *Gebia pugetensis*, which we dug out of the muddy shores.

When dredging, everything that came up was preserved, and the finer sand and mud boxed, and afterward dried and examined at home.

Of the Pelecypoda dredged, by far the commonest specimen was *Acila Lyalli*, of which at least a couple of thousand specimens were taken. Another common bivalve was *Cryptodon sericatus* Cpr., about 300 specimens. *Venericardia borealis* Conrad, *Nucula tenuis* Mont., and *Lucina tenuisculpta* Cpr., came next in order, about 100 of each being taken.

Of rarer shells may be mentioned, *Pecten Vancouverensis* Whiteaves and *hastatus* Sby., *Amusium caurinum* Gould, *Modiolaria lævigata* Gray and *nigra* Gray, *Crenella decussata* Mont., *Cardium blandum* Gould, *Fulvia modesta* Ad. and Rue., *Cryptodon flexuosus* Mont., *Astarte Esquimalti* Baird, and *undata* Gould, *Psephis Lordi* Baird, *Clementia subdiaphana* Cpr., *Venus Kennerleyi* Reeve, *Macoma yoldiformis* Cpr., *Cuspidaria pectinata* Cpr., *Kennerlia filosa* Cpr., etc.

Of the Gasteropoda the most abundant were, *Nassa mendica* Gould, *Nitidella Gouldii* Cpr., *Olivella baetica* Cpr., *Mesalia reticulata* Mighels, and the deep-water variety of *Margarita pupilla* Gould, of each of which more than one hundred specimens were obtained.

Of rarer shells the following is a partial list: *Drillia incisa* Cpr., and *cancellata* Cpr., *Mangilia sculpturata* Dall, *Cancellaria circumcincta* Dall, *Velutina lævigata* Linn., *Turbonilla torquata* Gould,

chocolata Cpr., and *Lordi* Smith, *Scala indianorum* Cpr., *Solariella peramabilis* Cpr., and *varicosa* Mighels, *Puncturella galeata* Gould, *cucullata* Gould, and *Cooperi* Cpr. (all living), *Cryptobranchia concentrica* Midd., *Ischnochiton interstinctus* Gould, and *cancellatus* Sby., *Placiphorella sinuata* Cpr., *Ulriculus incultus* Gould, and *Rictaxis punctocælata* Cpr., this last being new to our Vancouver list.

I have not attempted to give a complete list, as such would take up too much of THE NAUTILUS's valuable space, and would, moreover, be of little interest; but I think I have written enough to show how very abundant the Mollusca are in our seas, and how much may be accomplished in even a single day's collecting if one knows exactly how and where to look.

A REPLY TO "SOME (RESPONSIVE) REMARKS RELATIVE TO CYPRÆA GREEGORI, FORD."

BY EDGAR A. SMITH.

It is flattering to see that my remarks on Mr. Ford's so-called species of *Cypræa* have been deemed worthy of such lengthy consideration. It were easy to take Mr. Ford's paragraphs *seriatim*, to make sharp replies, and to confute them, but I value the pages of THE NAUTILUS too highly to occupy them with matter of that description. I will merely observe, then, that I have carefully reconsidered the subject, and I still am of opinion that Mr. Melvill's meaning is quite evident. It is to be regretted that Mr. Ford did not cut the leaves of the work he was consulting and carefully examine it, for, had he done so, he could not possibly have failed to see to which species Mr. Melvill assigned the var. *coloba*, and possibly he would have adopted that name. When I suggested that *even courtesy* directed us to employ Mr. Melvill's name, it occurred to me that possibly some persons might be ignorant of or disregard the friendly custom of adopting as a *specific* name one already used in a *varietal* sense by another, and the readers of THE NAUTILUS are now in a position to judge whether my supposition was well-founded.

In conclusion I would point out that it is hardly fair for a writer who is criticising the work of another, unnecessarily to put in inverted commas phrases and words which the general reader might estimate as quotations. The words "state of things," "reminded," "with thanks," do not occur among my observations, and the "bit of presumption" also emanates from Mr. Ford.

A LIST OF THE BRACHIOPODA, PELECYPODA, PTEROPODA, AND NUDIBRANCHIATA OF JAMAICA, LIVING AND FOSSIL.

COMPILED BY T. D. A. COCKERELL.

No list of the bivalve Mollusca of Jamaica has ever been published, and many of the commonest species are unrecorded from the island. The present compilation was prepared during the time I was Curator of the Jamaica Museum, and is, I think, almost as complete as the present state of knowledge will permit. But for the kindness of Mr. H. Vendryes in permitting me the free use of his collections and MSS. the list could never have been prepared, and it is, in the main, a monument of his industry, extending over a great number of years. Mr. Vendryes informed me that the specimens recorded by him might be regarded as correctly identified, as not only has he given them careful study himself, but they were submitted to and verified by Messrs. Swift and Carpenter.

All records are given as I found them, in alphabetical order under each group; synonymy being indicated by cross references.

The solitary nudibranch at the end may serve to remind students that there is a rich but *unknown* nudibranch fauna in the seas around Jamaica.

[Since writing the above, I have submitted the list to Mr. E. A. Smith, who has most kindly indicated some rectifications in the generic nomenclature, and searched some works inaccessible to me, with the result of discovering several additional records. Mr. Smith thinks that a thorough search through the different monographic works, and the older books, would reveal many other records. I regret I have neither time nor opportunity to make this search, but I do not think many *reliable* records would be found. Mr. Smith has discovered seven records (indicated in the list within brackets) which are certainly erroneous, and in the case of easily-recognized species attributed by older authors to Jamaica, but not found there since, I think we may well express some doubt. Specimens of various kinds were frequently brought to me at the Jamaica Museum, which I might easily have supposed Jamaican, without careful inquiry; such specimens would be from Colon principally, but in former days, when Jamaica was on the highway to the Pacific and antipodes, they might have come from more distant

points. Undoubtedly, the marine shells of Jamaica are imperfectly known, but the additions will be made by dredging and such means, and will not be found in such collections as were probably examined by the earlier writers.]

I. Brachiopoda.

Cistella barrettiana, Dav.: Davidson, Zool. Challenger, 1, p. 22; Zool. Rec., 1866, p. 212.

woodwardiana, Dav.: Davidson, Zool. Challenger, 1, p. 22; Zool. Rec. 1866, p. 212.

Discina striata, Lam.: Vendryes Coll., =? antillarum, d'Orb., teste E. A. Smith.

Terebratula sp. undet.: Barrett, Proc., Geol. Soc., 1866, p. 282. (foss.).

Terebratulina caputserpentis, L.: Davidson, Zool. Challenger, 1, p. 13.

Thecidium barretti, Woodw.: Davidson, Zool. Challenger, 1, p. 23 (foss. and viv.).

mediterraneum, Risso: Davidson, Zool. Challenger, 1, p. 23.

II. Pelecypoda.

Anomia ephippium? L.: Bowden, Vendryes MS. (foss.)=simplex?

simplex, d'Orb.: Vendryes Coll.

Arca adamsi, Shuttl.: E. A. Smith, Jr. Linn. Soc., 1890, p. 499.

[*antiquata*, L.: Dillw. Cat. Rec. Shells, but not truly Jamaican, teste E. A. Smith.]

candida, Chem.: Vendryes Coll.

carinifera, Adams: Jay, Cat. Shells, Ed. 1850, teste E. A. Smith.

chemnitzii, Phil.: Vendryes Coll.=? inœquivalvis.

consobrina, Sby.: Guppy, Geol. Mag., 1874; Ether. in Sawkins, p. 336 (foss.).

deshayesi, Hanley: Vendryes Coll.

domingensis, Lam.: Vendryes Coll.

d'orbignyi, Reeve: Vendryes Coll.

imbricata, Brug.: Dillw. Cat. Rec. Shells; Jay Cat. Shells, Ed. 1850, teste E. A. Smith.

inequilateralis, Guppy: Guppy, Geol. Mag., 1874 (foss.).

jamaicensis, Gm.: Turt. Linn., iv, p. 555. =candida.

listeri, Phil.: Vendryes Coll (viv.), Bowden, id. (foss.).
noae, L.: Ether. in Sawk., p. 336 (foss.); Vendryes Coll. (viv).
occidentalis, Phil.: Guppy, Geol. Mag., 1874 (foss.); Vendryes Coll. (viv.).
pexata, Say; Vendryes Coll.
rhombea, Born: Hunt's Bay, Vendryes Coll.
[*senilis*, Dillw.: Dillw. Cat. Rec. Shells, but recorded in error, teste E. A. Smith.]
tenera, C. B. Ad.: Vendryes MS. Cat.
umbonata, Lam.: Lamk., vi, p. 38.

Asaphis coccinea, Mart.: Vendryes Coll.

Avicula jamaicensis, Dunker: Dunker's orig. descr., teste E. A. Smith (viv. and foss.).
macroptera, Lam.: Vendryes Coll.
radiata, Leach: Vendryes Coll.

Barrettia monilifera, S. P. Woodw.: Ether. in Sawkins, p. 308–310 (foss.)=Hippurites.

Caprina sp. Ether. in Sawkins, p. 308 (foss.).

Caprinella sp. Ether. in Sawkins, p. 308 (foss.).

Cardita ovata, C. B. Ad.: Vendryes MS. Cat.
scabricostata, Guppy: Guppy, Geol. Mag., 1874 (foss.).

Cardium antillarum, d'Orb.: d'Orbigny's orig. descr., teste E. A. Smith.
[*apertum*, Chem.: Jay. Cat. Shells, Ed. 1850, but record erroneous, teste E. A. Smith.]
(*Fulvia*) *bullatum*, L.: Vendryes Coll.
? *citrinum*, Chem.: Bowden, Vendryes MS.=serratum (foss.).
domingensis, d'Orb.: Vendryes Coll.
? *dominicensis*, Gabb: Bowden, Vendryes MS. (foss.).
elongatum, Brug.: Vendryes Coll.
graniferum, Brod. and Sow.: Vendryes Coll.
haitense, Sby.: Guppy, Geol. Mag., 1874 (foss.).
inconspicuum, Guppy: Guppy, Geol. Mag., 1874 (foss.).
(*Trachicardium*) *isocardia*, L.: North Side, Vendryes Coll.
(*Lævicardium*) *lævigatum*, L.: Kingston Harbor, Morant Bay, Vendryes Coll.
lingua-leonis, Guppy: Guppy Geol. Mag., 1874 (foss.)=subelongatum.
medium, L.: Vendryes Coll.

muricatum, L.: Kingston Harbor, Vendryes Coll. (viv.), Bowden, id. (foss.).
rusticum, L.: (Lister) Lamk., vi, p. 12.
serratum L.: Vendryes Coll.=lævicardium, teste E. A. Smith.
spinosum, Meuschn.: Vendryes Coll.
subelongatum, Sby.: Vendryes Coll.
Chama arcinella, Linn.: Guppy, Geol. Mag., 1874 (foss.); Vendryes Coll. (viv.).
gryphoides, Linn.: (see Turt. Linn., iv, p. 247).
involuta, Guppy: Guppy, Geol. Mag., 1874 (foss.).
[*lazarus*, L.: Dillw. Cat. Rec. Shells, but record erroneous, teste E. A. Smith.]
lobata, Brod.: Vendryes Coll.
macrophylla, Chem.: Mörch. Mal. Blätt., 1877, p. 119.
ruderalis, Lam.: Bowden, Vendryes MS. (foss.).
Circe minima, : Bowden, Vendryes MS. (foss.)? Kingston Harbor, id. (viv.).
cerina, C. B. Ads.: Kingston Harbor, Vendryes Coll.
? *Coralliophaga* sp. Ether. in Sawkins, p. 323 (foss.).
Corbula barrattiana, C. B. Ad.: Contr. Conch., p. 237.
blandiana, C. B. Ad.: Contr. Conch., p. 234.
chittyana, C. B Ad.: Contr. Conch., p. 238.
contracta, Say: Dall., Bull. 37, U. S. N. M., p. 70.
cubaniana, d'Orb: Dall., Bull. 37, U. S. N. M., p. 70 (viv.; and ? foss.).
dietziana, C. B. Ad.: Contr. Conch., p. 235=tahitensis.
disparilis, d'Orb.: Kingston Harbor, Vendryes Coll.
kjæriana, C. B. Ad.: Contr. Conch., p. 237=caribea, d'Orb.
knoxiana, C. B. Ad.: Contr. Conch., p. 238=cubaniana.
krebsiana, C. B. Ad.: Contr. Conch., p. 234.
lavalleana, d'Orb.: Kingston Harbor, Vendryes Coll.
operculata, Phil.: Kingston Harbor, Vendryes Coll.
swiftiana, C. B. Ad.: Contr. Coch., p. 236=caribea.
tahitensis, Lam.: Kingston Harbor, Vendryes Coll.
rieta, Guppy: Guppy, Geol. Mag., 1874 (foss.)=disparilis.
viminea, Guppy: Guppy, Geol. Mag., 1874 (foss.)=Bothrocorbula.
Crassatella Marylandica? Conrad: Vendryes MS. (foss.).
Crassinella? martinicensis, d'Orb.: Bowden, Vendryes MS.=Gouldia (foss.).

Cuspidaria cleryana, d'Orb. (Sphena): orig. descr., teste E. A. Smith.
costellata, Desh.: Guppy, Proc. Geol. Soc., 1866, p. 575 (foss.)
=? ornatissima d'Orb.
Cytherea carbasea, Guppy: Guppy, Geol. Mag., 1874 (foss.).
planivieta, Guppy: Guppy, Geol. Mag., 1874 (foss.).
trigonella, Lam.: Vendryes MS. Cat.
affinis, Gmel.: Vendryes Coll.
Dione, Gray=Cytherea, subg.
albida, Gmel.: Desh., Cat. Conch. B. Mus., 1 (1853), p. 69.
convexa, Say: Bowden, Vendryes MS. (foss.).
maculata, L.: Vendryes Coll.
Diplodonta candeana ? d'Orb.: Bowden, Vendryes MS. (foss.).
janeirensis, Rve.: Hunt's Bay, Vendryes Coll.
soror, C. B. Ad.: Dall., Bull. 37, U. S. N. Mus., p. 52.

[*To be concluded in next number.*]

NOTICES OF NEW CHITONS, I.

BY H. A. PILSBRY.

Meturoplax n. subg. of **Acanthochites**.

Subg. char.:—valves i to vii as in Acanthochites, but dorsal (jugular) areas indistinctly differentiated; *valve viii having the mucro posterior, the insertion plate strongly directed forward*, with one slit on each side, and no sinus behind. Girdle as in *Acanthochites*. Type, *A. retrojectus*.

This group holds the same relation to *Acanthochites* that *Pallochiton* holds to *Chætopleura*. It is a variation distinctly in the direction of the *Cryptoplacidæ*, recalling *Choneplax*, and clearly showing the Acanthochitoid genesis of that family.

A. retrojectus n. sp.

Shell small, narrow and elongated, convex, not carinated; black or black-brown, with a whitish "v" or three white stripes on each valve, sometimes broadly maculated with whitish at the sides.

Intermediate valves moderately beaked (except valve ii, the posterior margin of which is straight), sculptured with comparatively coarse, rounded, scattered pustules, which become smaller and more crowded toward the middle, and are lower and less distinct on the ridge, no areas being distinctly differentiated on the valves. End

valves similarly sculptured. Posterior valve small, having the mucro obtuse and posterior, the posterior slope short, vertical.

Interior green, marked with black in the cavity. Head valve having the insertion plate about one-third as long as the front slope of the tegmentum, with 5 small slits. Intermediate valves having very oblique plates with 1–1 minute posterior slits. Posterior valve having the insertion plate short and strongly directed forward, with a small slit on each side. Sutural laminæ rather long and narrow, projecting far forward. Sinus wide, deep, and square.

Girdle microscopically chaffy, with a series of hyaline spicules at the edge, and 18 small and compact silvery tufts.

Length 9½; width 3½ mill. (dry specimen).

Port Jackson, near Sydney. Abundant. Collected by Dr. J. C. Cox.

GENERAL NOTES.

Alcyna.—Specimens of the rare *Alcyna ocellata* A. Ad. are included in Mr. F. Stearns' last collection of Japanese mollusks. It proves to have a corneous operculum, and therefore belongs to the *Trochidæ* instead of the *Phasianellidæ*, where it has hitherto been placed.—*H. A. P.*

S. Australian Mollusca.—"A Hand List of the Aquatic Mollusca Inhabiting S. Australia" has been issued by D. J. Adcock, Adelaide, S. Australia. It will prove very useful to those interested in this fauna.

Contributions to the Natural History of Texas.—I. Texas Mollusca.—By J. A. Singley (Geol. Survey of Texas). A complete list of species known from the State, with useful notes. Mr. Singley's personal researches have covered a large part of the State, but he has supplemented them with citations of Texan localities by other authors, especially Binney and Dall. The paper forms a very useful basis for further operations in the field of Texas conchology.

Report on the Artesian Wells of the Gulf Coastal Region (of Texas). By J. A. Singley (Geol. Survey of Texas, 4th Annual Report). This paper is evidently the result of much careful investigation, and will be especially valuable to those interested in Tertiary and Quaternary Geology of the Gulf region.

THE NAUTILUS.

VOL. VII. FEBRUARY, 1894. No. 10

A NEW SPECIES OF PATELLA.

BY H. A. PILSBRY.

Patella kermadecensis n. sp.

Shell large and massive, conical, the apex subcentral; slopes of cone nearly straight; outline short ovate, slightly narrower in front. Exterior whitish, apparently strongly ribbed when perfect, but the specimens described are everywhere deeply eroded. Border lightly scalloped by the ribbing, and finely puckered at the edge. Muscle-scar roughened, strongly marked, and either white or bright orange; rest of the interior white, stained in places with livid-brown or purplish.

Length 135, breadth 115, alt. 48 mm.

Length 111, breadth 102, alt. 45 mm.

Habitat, Kermadec Is.

The two specimens above described, of this large species of the subgenus *Scutellastra*, were sent to me by Mr. E. W. ROPER, of Revere, Mass., who obtained them from the original collector. The species can be compared only with *P. patriarcha* Pils. from the Cape of Good Hope, and *P. mexicana* Brod. & Sowb. from West Mexico. The former of these is a wider, more angular species; the latter is more oblong, and has more obvious primary ribs. Figures will be published later.

NOTES ON COLLECTING SHELLS IN JAMAICA.

BY CHAS. T. SIMPSON.

About the first of December, Mr. John B. Henderson, Jr., of Washington, and the writer visited the island of Jamaica for the purpose, principally, of collecting land, fresh-water and marine mollusks. We called on Mr. Henry Vindryes, a veteran collector and conchologist in Kingston, inspecting his magnificent set of Jamaica Shells, and receiving from him every possible courtesy and many useful notes as to localities.

As our stay was to be limited to some three weeks, we were anxious to begin work at once, to actually put our hands on some of the land snails in their homes. We hired a cab with a good natured darkey for a driver, and a miserable, little, bony horse, of uncertain color, and started for the suburbs, in the direction of Rockport with our eyes strained to catch sight of the splendid *Orthalicus undatus*, which we were told we might find on our way. The poor little horse, which wobbled about first from one side of the road to the other as if in search of snails, but probably from sheer exhaustion, was suddenly brought to a standstill without much exertion by the driver, who exclaimed as he pointed his whip to some low trees on the south of the road "Da de snail you want massa." I think we had all observed them at the same moment, and with a shout like boys we were out of the cab and racing across the road, through a terrible hedge of wild pinguin in less time than it takes to write it. There they were, great beantiful fellows, variegated with ash color and glossy black, one, a half dozen, fifty, a hundred, in fact without limit! They clung to all kinds of trees and shrubs in the low tangled scrub, and in great numbers to the tall cylindrical Spring Cereus; in almost every case glued by an epiphragm so solid that it was well nigh impossible to dislodge them, and invariably with the spire pointing downward.

When we came out of the woods an hour afterward we were as wet with perspiration as though we had been dipped in water, and covered with every description of sticking burrs; our flesh was lacerated, and our hands dirty and bleeding, for everything in the scrub bears villainous thorns. On the debtor side we had ruined two suits of clothes, and to our credit could be placed over five hundred superb living *Orthalicus*. We had learned a lesson, too,

worth remembering, viz, never wear anything decent when collecting in the tropics.

During our stay we drove around the entire island, visiting every parish. Owing to the worthlessness of our team, the illness of the driver, and the almost incessant rains we encountered on the north side, our opportunities for collecting were greatly diminished.

It was only when we stopped over a day or so at the towns that we were able to get any great amount of material. Strangely enough we found almost no marine species whatever. Occasionally on the rocky beaches we obtained *Neritina virginea*, a few *Littorinas*, *Tectarius* and *Neritinas*, but for miles, in fact along whole parishes, though the road ran near to the sea, and we watched closely, not even a valve was seen.

The lack of marine forms was made up in the abundance of the land snails, and in some cases the fresh water species. In a branch of the delta of Roaring River, under a great breadfruit tree, H. picked up a dead *Hemisinus lincolatus*. Then I looked on the rocky and sandy bottom and found it alive by handfulls, and we met with it in quantities elsewhere.

We kept an eager watch for the great white *Helix aspera*. My friend picked up a single dead specimen on the road near Falmouth, and this fairly turned our heads. We inquired of every darkey from that on, hearing of it often like the Ignis fatuŭs, just a little way out of reach. Near Montego Bay we got a few more dead ones, and again as it was growing dark we discovered a dozen or so on the bushes and vines when we were nearing Savanna la Mar. The next day I started out early for a walk, resolved to find this snail if thorough search would do it. I tramped the whole forenoon and got only a few *Ampullarias*, and two o'olock found me tired, hungry, and thoroughly disgusted, seven miles from our hotel, and uncertain whether to push on to some low hills a mile ahead, or to give it up and go back. My resolve determined me and I went on. The first rounded knoll looked well at a little distance—one learns in a short time to distinguish good from poor localities a long way off. The elevation did not occupy more than half an acre ; red clay with decomposed limestone. It was originally a dwarf scrub which had been partly cleaved a couple of weeks before. The first thing I saw was a fine dead *Helix aspera* on the ground, then others, there they lay thickly all around me, bright and fresh, with the animals nicely cleared out by tropic showers, the sun, and swarming insects.

I hardly dared move for fear of stepping on them, and to calm my excitement, and assure myself that it was not all a wild conchologist's dream, I stood still and tried to count a hundred, but when I had got to twenty I saw half a dozen live ones clinging like a string of enormous white beads to a little shrub right beside me, and I quit counting and gathered them in. Then I sat down and without moving I picked up thirty fresh, cabinet specimens. About that time it just began to dawn on me that the great *Lucerna acuta* was as abundant as the *aspera*, and in no time I had my hands full of the fine, big, brown fellows. Afterward I got me eyes focussed down to seeing *Sagdas*, *Helix sinuata*, three or four *Cylindrellas* and as many *Tudoras*, and that under the leaves, and among rubbish there were quantities of small *Glandinas*, *Zonites* and *Microphysas*, that the ground when closely examined was literally bespangled with lovely little *Proserpinas*, that shone in the sun like polished opals.

To my dying day I never expect again to see such collecting unless I revisit Jamaica. Hunger, fatigue, headache, the flight of time were forgotten, and I was only warned that I must return by the fact that the sun was nearly down before I knew it, and that I had an eight mile walk and darkness before me. On a little spot no larger than a city lot, I had taken in a few hours over thirty species of land shells. As I reluctantly tore myself away I took fifteen *asperas* from a small Mango, and on the border of the clearing where some one had bent together a couple of young logwood trees, not as large as my wrist, I picked twenty-five more fully adult and one young one.

Shall I tell how in a narrow limestone gorge of the Rio Cobre near Bogwalk in the talus under a ledge some two rods long we found no less than forty-five species, all living, and nearly every specimen in perfect condition ; or how at Mandeville the honey-combed rocks were crowded with lovely *Choanopomas*, rough as chestnut burrs, now H. wild with excitement and regardless of bats, centipedes, scorpions, and poisonous vines wedged himself into a dark cave whose mouth was at least two sizes too small for his body ; how he stuck fast, and alone and far from help, could neither get forward or backward for awhile, how he pushed on to be rewarded by finding quantities of *Helix peracutissima* and the great purple *H. jamaicensis*, the latter clinging to each other on the roof like so many stalactites, a snail which, by the way, we had repeatedly been told was extinct ! I fear it may be now.

It is enough to say that for the brief time and limited opportunities we had, our trip was a success, and we left with many regrets that we could not spend the rest of the winter on the island, and thoroughly explore it, and collect its inexhaustible treasures.

A LIST OF THE BRACHIOPODA, PELECYPODA, PTEROPODA, AND NUDIBRANCHIATA OF JAMAICA, LIVING AND FOSSIL.

COMPILED BY T. D. A. COCKERELL.

[*Continued from p.* 107.]

Donax denticulata, L.: Milk River Beach, Pt. Morant, Vendryes Coll. (viv. and foss.).

[*rostratus*, Adams: Jay, Cat. Shells, Ed. 1850, but record erroneous, teste E. A. Smith.]

Dosinia concentrica, Lam.: Vendryes Coll. (viv. and foss.).

incerta, Verkruzen (MS.?): Paetel, Cat. Conch. Samml., 1890, teste E. A. Smith.

Ervilia nitens, Montagu: Vendryes Coll.

Erycina sp. Bowden, Vendryes MS. (foss.).

Gastrochæna chemnitziana, d'Orb.: Vendryes Coll. (viv. and foss.).

cuneiformis, Spengler: Vendryes Coll.

Eriphyla lunulata, Conr.: Kingston Harbor, Vendryes Coll.

var. *parva* C. B. Ads. Vendryes MS. Cat.

Inoceramus sp. Ether. in Sawkins, p. 308 (foss.).

Leda acuta, Conr.: Bowden, Vendryes MS. (foss.).

bisulcata, Guppy: Guppy, Geol. Mag., 1874 (foss.).

clara, Guppy: Guppy, Geol. Mag., 1874 (foss.).

corpulenta, Dall: Dall, Bull. 37, U. S. Nat. Mus., p. 44.

illecta, Guppy: Bowden, Vendryes MS. (foss.).

jamaicensis, d'Orb.: Vendryes Coll.

vitrea, d'Orb.: orig. descr., teste E. A. Smith.

Lima carribea, D'Orb.: Vendryes Coll.=? squamosa.

scabra, Born: Vendryes Coll.

Limopsis aurita, Brocchi, var. *paucidentata*, Dall: Dall, Bull. 37, U. S. Nat. Mus., p. 42.

Lithophagus bisulcatus, D'Orb.: teste E. A. Smith.

caudiger, Lamk.: Rockfort, Vendryes Coll. (as Modiola).

Lithophagus cinnamomeus, Chemn.: teste E. A. Smith.
gossei, Rve.: orig. descr., teste E. A. Smith.
[*lithophagus*, L.: Dillw. Cat. Rec. Shells, but record erroneous, teste E. A. Smith.]
caudigera, Lam.: Rockfort, Kingston, Vendryes Coll.
forficatus, Ravenel: Dall, Bull. 37, U. S. Nat. Mus., p. 38.

Loripes anatelloides, Rve.: Paetel, Cat. Conch. Samml. 1890, teste E. A. Smith.

Lucina americana, C. B. Ad.: Ad., Contr. Conch., p. 243=*quadrisulcata* d'Orb., teste E. A. Smith.
antillarum, Reeve: Ad., Contr. Conch., p. 243. (=*ornata*, C. B. Ad. non Rve.) (viv. and foss.).
candeana, d'Orb.: Vendryes Coll.
costata, d'Orb.: orig. descr., teste E. A. Smith.
crenulata, Say: Bowden, Vendryes Coll.
dentata, Wood: Vendryes Coll. (Subgen. *Divaricella*).
[*digitalis*, Lam.: Jay, Cat. Shells, Ed. 1850, but the record erroneous, teste E. A. Smith.]
divaricata, L.: Bowden, Vendryes MS. =*dentata*, Wood. (viv. and foss.).
edentula, L.: Lam., V, p. 540. (C. B. Ad. also). =*Loripes*.
granulosa, C. B. Ad.: Ad., Contr. Conch., p. 245.
imbricata, C. B. Ad.: Ad., Contr. Conch., p. 245. (=*pecten* Rve.).
imbricatula, C. B. Ad.: Vendryes Coll.
jamaicensis, Chem.: Ad., Contr. Conch., p. 245.
janeirensis, Reeve: Ad., Contr. Conch., p. 245. (=*subglobosa*, C. B. Ad.).
muricata, Chem.: fide d'Orb., teste E. A. Smith.
nasuta? Conr.: Bowden, Vendryes MS. (foss.).
occidentalis, Reeve: Kingston Harbor, Vendryes Coll. = *imbricata*, Ad.
pecten, Reeve (? Lam.): Bowden, Vendryes MS.=*imbricata?* (foss.)
pectinata, C. B. Ad.: Ad., Contr. Conch., p. 245–6. (viv. and foss.).
pectirella, C. B. Ad.: Ad., Contr. Conch., p. 246.
pennsylvanica, L.: Ad., Contr. Conch., p. 246 (viv.); Guppy Geol. Mag., 1874 (foss.).

Lucina pulchella, C. B. Ad.: Vendryes MS. Cat.
scabra, Reeve (? Lam.): Ad., Contr. Conch., p. 247.
soror, C. B. Ad.: Ad., Contr. Conch., p. 247.
subglobosa, Adams (MS.?): Jay, Cat. Shells, Ed. 1850, teste E. A. Smith.
(*Codakia*) *tigerina*, L.: Ad., Contr. Conch., p. 247.
virgo? Reeve: Ad., Contr. Conch., p. 247.
Macoma cerina, C. B. Ad.: Dall, Bull. 37, U. S. N. M., p. 60.
Mactra alata, Spg.: Morant Bay, Vendryes Coll. =*carinata*, Lam. (viv. et. foss.).
(*Spisula*) *bilineata*, C. B. Ad.: Vendryes MS. Cat.
braziliana, Lam.: Vendryes Coll.
(*Spisula*) *subimbricata?* Mont.: Vendryes MS. Cat.
elegans, Sowb.: Vendryes Coll.
Modiola americana, Leach: Vendryes Coll. (Mr. Smith adds a?)
barbata, C. B. Ad.: orig. descr., teste E. A. Smith.
demissa, Dillw.: Vendryes Coll. (=*plicatula*, Lamk.,) teste E. A. Smith.
Myonera lamellifera, Dall: Dall, Bull. 37, U. S. N. M., p. 68.
Mytilus canalis, Lam.: Lam., VI, p. 123. (Mr. Smith adds a?)
exustus, L.: Bowden (foss.), Dry Harbor (viv.), Vendryes Coll. (viv. et foss.).
Nuculocardia divaricata, d'Orb.: orig. descr., teste E. A. Smith.
Ostrea carinata, : Cat. Sawkins Coll., No. 133. (foss.).
folium, L.: Dillw. Cat. Rec. Shells, teste E. A. Smith.
parasitica, Gmel.: Bluefield Point, Vendryes Coll.
plicatula, Gmel.: Vendryes Coll.
Pecten exasperatus, Sow.: Port Antonio, Vendryes Coll.
exasperatus (nec Sow.): Guppy, Geol. Mag., 1894. (foss.). = *oxygonus*.
inæqualis, Sow.: Guppy, Geol. Mag., 1874. (foss.).
nucleus, Born: Vendryes Coll. (viv. et foss.)
ornatus, Lam.: Port Antonio, Vendryes Coll.
oxygonus, Sow.: Bowden, Vendryes MS. (foss.)
thetidis, Sow. (var.): Bowden, Vendryes Coll. (foss.).
zigzag, Chem.: Vendryes Coll. (viv. et foss.).
var. *alba*, : shell white, Vendryes Coll.
gibba, L. (Turt, Lim. IV, p. 267).
Pectunculus acuticostatus, Sow.: Guppy, Geol. Mag., 1874. (foss.).
angulatus, Lam.: Vendryes Coll.

Pectunculus angulosus, Gmel.: Dillw., Cat. Rec. Shells, teste E. A. Smith.
castaneus, Lam.: Port Antonio, Vendryes Coll.
decussatus, L.: Guppy, Geol. Mag., 1874. (foss.).
pectinatus, Gmelin: Vendryes Coll.
pennaceus, Lam.: Ether. in Sawkins, p. 337. (foss.). = *decussatus*.
undatus, L.: Dillw., Cat. Rec. Shells, teste E. A. Smith.
Perna bicolor, C. B. Ad.: Kingston Harbor, Vendryes Coll.
ephippium, Linn.: Dall, Bull. 37, U. S. N. Mus., p. 36.
obliqua, Lam.: Vendryes Coll.
rigida, Dillw.: Vendryes MS. Cat.
Pholas clavata, Lam.: (see Lam., V, p. 446). =*pusillus*, L.
corticaria, Sow.: C. B. Ad,, Contr. Conch., p. 75. (=*Martesia*) teste E. A. Smith.
pusillus, L.: (see Turt. Linn., IV, p. 173). =*striata*.
striata, L.: Rockfort, Vendryes Coll. (=*Martesia*) teste E. A. Smith.
Pinna muricata, L.: Vendryes Coll.
Placuna sinuosa, : Ether. in Sawkins, p. 336. (foss.).
Placunanomia echinata, Brod.: Kingston Harbor, Vendryes Coll.
Plicatula cristata, Lam.: Paetel, Cat. Conch. Samml., 1890, teste E. A. Smith.
plicata, Chem.: Kingston Harbor, Vendryes Coll.
reniformis, Lam.: Lam., VI, p. 185. =*barbadensis*, Petiver.
vexillata, Guppy: Guppy, Geol. Mag., 1874.
Psammobia affinis, C. B. Ad.: Vendryes MS. Cat.
biradiata, C. B. Ad.: Vendryes MS. Cat.
cerina. C. B. Ad.: Vendryes MS. Cat.
purpureo-maculata, C. B. Ad.. Vendyres MS. Cat.
Radiolites, sp. Ether. in Sawkins, p. 308. (foss.).
Sanguinolaria rosea, Chem.: Lam., V, p. 511. =*sanguinolentus*, Gm., Vendryes Coll.
Semele jayanum, C. B. Ad.: Vendryes Coll. =*cordiformis*, Chem.
proxima, C. B. Ad.: Vendryes Coll. = ? *elliptica*, Sby.
reticularis, L.: Vendryes Coll.
variegata, Lam.: Vendryes Coll.
Tagelus bidens, Chem.: Kingston Harbor, Vendryes Coll.
caribœus, Lam.: fide d'Orb,, teste E. A. Smith. =*gibbus*, Speng.

Solen ambiguus, Lam.: Vendryes Coll. (viv. et foss.).
Spondylus bostrychites, Guppy: Guppy, Geol. Mag., 1874. (foss.).
Strigilla carnaria, L.: Morant Bay; Port Antonio, Vendryes Coll.
carnaria, var. *miocenica*, : Bowden, Vendryes MS. (foss.).
flexuosa, Say: Bowden, Vendryes MS. (foss.). Morant Bay, Port Antonio, Vendryes Coll.
producta, Tryon: Zool. Rec., 1870, p. 172. Morant Bay, Vendryes Coll.
pisiformis, L.: Morant Bay, Vendryes Coll.
Tellina antonii, Phil.: Kingston Harbor, Vendryes Coll.
arcuata, Sow.: Vendryes MS. Cat.
(*Arcopagia*) *bimaculata*, L.: Kingston Harbor, Vendryes Coll.
(*Peronœoderma*) *biradiata*, Schum.: Vendryes Coll.
carribœa, d'Orb.: Vendryes Coll.
(*Angulus*) *constricta*, Phil.: Vendryes Coll.
(*Angulus*) *cuneatus*, d'Orb.: Hunt's Bay, Kingston Harbor, Vendryes Coll.
decussatula, C. B. Ad.: Vendryes MS. Cat.
(*Arcopagia*) *fausta*, Sol.- Vendryes Coll.
(*Angulus*) *guadaloupensis*: D'Orb.: Kingston Harbor, Vendryes Coll.
jamaicensis, : Turt. Linn., IV, p. 193.
lineata, Turton: Vendryes Coll.
lintea, Conrad: Dall, Bull. 37, U. S. Nat. Mus., p. 60.
(*Angulus*) *martinicensis*, d'Orb.: Hunt's Bay, Kingston Harbor, Vendryes Coll.
nitens, Adams: orig. descr., teste E. A. Smith.
punicea, Born: Vendryes Coll.
radiata, L.: Vendryes Coll. (viv.) Bowden, Vendryes MS. (foss.) (viv. et foss.).
var. *unimaculata*, Lam.: Vendryes Coll.
striata, Chem.: Vendryes Coll.
subradiata, Schum.: Hunt's Bay, Vendryes Coll.
tumida, Sow.: Vendryes MS. Cat.
Teredo fistula, Lea: Bowden, Vendryes MS. (foss.).
navalis, L: Vendryes Coll.
Trigonulina ornata, d'Orb.: Vendryes MS. Cat. (ex Chenu.)
Venus antillarum, d'Orb., orig. descr., teste E. A. Smith.

Venus blandiana, Guppy: Guppy, Geol. Mag., 1874. (foss.).
braziliana, Gm.: Plumb Point L. Ho., Milk River Mouth, Vendryes Coll.
cancellata, L.: Pt. Morant, Vendryes Coll. (viv.), Bowden, id. (foss.).
cardioides, Lam.: Lam., V, p. 590.
flexuosa, Lam.: Port Antonio, Vendryes Coll.
granulosa, Gmel.: Pt. Morant, Kingston Harbor, Vendryes Coll.
listeri, Hanley: Port Antonio, Vendryes Coll.
maculata, L.: orig. descr., teste E. A. Smith.
macrodon, Lam.: Vendryes Coll.
paphia, L.: Guppy, Geol. Mag., 1874 (foss.); Vendryes Coll. (viv.).
reticulata, Lam.: Vendryes Coll,
rubra, Gm.: Turt. Linn., IV, p. 236. =? *Cytherea circinata.*
rugosa, Gm., Chem.: Guppy, Geol. Mag., 1874. (foss.), Vendryes Coll. (viv.).
subrostrata, Lam.: Vendryes Coll.
subrugosa, Sowb.: Port Antonio, Vendryes Coll.
walli, Guppy: Bowden, Vendryes MS. (foss.).
woodwardi, Guppy: Guppy, Geol. Mag., 1874. (foss.).
zigzag, L.: Pt. Morant, Vendryes Coll.

Pisidium pygmœum, C. B. Ad.: (Cyclas) Contr. Conch., Vendryes List, p. 487. (=*jamaicense*, Prime) =*adamsi*, Desh.: Desh., 11, p. 184.

Sphœrium veatleyi, C. B. Ad.: (Cyclas) Contr. Conch., Vendryes List, p. 487. Desh., 11, p. 283.

Pteropoda.

Cleodora sp. Ether. in Sawkins, p. 319. (foss.).
pyramidata, L.: (See Turt. Linn., IV, p. 17).
retusa, . (see Turt. Linn., IV, p. 117)

Creseis sp. Ether. in Sawkins, p. 319. (foss.).

Cuvieria sp. Ether. in Sawkins, p. 319. (foss.).

Hyalœa (*Diacria*) *vendryesiana*, Guppy: Guppy, Geol. Mag., 1874. (foss.).

Nudibranchiata.

Glaucus atlanticus, Foster: R. Bergh, Chall. Rep., Zool., X, p. 11.

NOTICES OF NEW CHITONS, II.

BY H. A. PILSBRY.

Chiton Coxi, n. sp.

Shell oblong, much elevated, carinated; delicate bluish mottled or blotched with olive-brown, yellow and white; girdle delicate blue-green, with narrow white bars. Sculpture as in *Ch. jugosus* Gld., but grooves of the pleura shorter, straighter, narrower, and more spaced. Girdle-scales convex, shining, microscopically and superficially striated, each measuring about .30 mm. wide. Length 13, breadth 7½ mm.; divergence, 90 to 110°.

Port Jackson (Dr. J. C. Cox!)

This is probably the *Lophyrus jugosus* of Angas' Port Jackson Catalogue, P. Z. S. 1867. It differs from Goulds' species in the totally diverse color-pattern, etc.

Acanthochites granostriatus n. sp.

Elongated, the tegmentum occupying about one third the total width in dry specimens. Valves obtusely keeled, the dorsal ridge indistiently clouded with whitish, orange and blackish; side mottled in varied patterns with olive and white. Girdle olive, the 18 tufts silvery stained with blue or dirty olive.

Valves distinctly imbricating; the dorsal areas rather wide, convex, distinct but not raised at the edges, having numerous rather weak longitudinal striæ. Side areas having elevated pustules arranged radially and connected by opaque lines giving the aspect of radial striæ. Tegmentum of post. v. subcircular, the mucro rather acute and elevated, at the posterior third. Length 9, breadth 3½ mm. Port Jackson and Port Hacking, N. S. Wales (Dr. J. C. Cox!)

Acanthochites Coxi, n. sp.

Valves grayish, somewhat mottled with olive and fleshy, the dorsal areas dark red or marked with olivaceous. Girdle olivaceous. Valves nearly disconnected by spiculose bridges of girdle tissue at the sutures. Dorsal areas longitudinally striate; sides sculptured with convex pustules elongated radially. Tegmentum of posterior valve subcircular, slightly wider than long, the rather elevated, acute mucro slightly behind the middle. Interior rose colored.

Girdle densely clothed with short, hyaline spicules, the tufts represented by inconspicuous clumps of slightly longer spines. Length 23, breadth 13 mm.

Port Jackson, N. S. Wales, (Dr. J. C. Cox !)

Acanthochites Matthewsi Bednall & Pilsbry.

Much elongated, keeled, flesh-tinted with several olivaceous forward-converging zigzag bands on each valve. Posterior margins of valves i–vii concave, beaks small. Dorsal areas narrow, rounded, with very fine, indistinct striæ; side areas having an indistinct diagonal riblet; *pleura longitudinally ribbed*, lateral areas obliquely ribbed, the ribs more or less cut into granules. Tegmentum of post. v. short-ovate, slightly longer than wide, its front half ribbed, posterior half granulated. *Mucro* between the posterior third and fourth of the length of tegmentum, *strongly hooked backward, the slope behind it very concave.* Girdle narrow, tufts inconspicuous. Length, 26, breadth, 8 mm.

South Australia. Collected by Mr. E. H. Matthews. The sculpture is totally unlike that of any other known *Acanthochites.*

Illustrations of the above species will be given later.

GENERAL NOTES.

The death of Dr. Paul Fischer of Paris has been announced.

Mr. C. W. Johnson will spend the latter part of January in Cambridge, studying types of Diptera and Mollusca in the Museum of Comparative Zoology.

Mr. E. W. Roper of Revere, Mass., has sailed for Jamaica where he purposes spending some time.

Mr. A. W. Hanham, formerly of Quebec, is now permanently located at Winnepeg. His address is "The Bank of British North America, Winnepeg, Manitoba, Canada."

THE NAUTILUS.

VOL. VII. MARCH, 1894. No. 11

SHELL COLLECTING IN NORTHERN ALABAMA.

BY H. E. SARGENT, WOODVILLE, ALA.

Huntsville, Alabama., the county seat of Madison County, is a somewhat exceptional southern city in that it has an abundant supply of pure spring water bursting forth from its very foundations. This spring of sparkling lime water, beside supplying the city mains, affords a constant stream several feet in width and several inches in depth to go to waste. In this stream and also in the reservoir I have, upon several occasions, taken large numbers of *Goniobasis nassula* Con., var. *perstriata* Lea. A recent visit, however, disclosed the fact that although still plentiful in the reservoir, this interesting species has almost disappeared from the stream. A flock of geese near by offered a possible solution of the mystery.

Upon this occasion, a more careful search was made than upon former visits, with very satisfactory results. The upper surfaces of the rocks were found to be covered with a species of Ammicola which the Editor refers to a form previously had from Florida, and for which he proposes the name of *Ammicola olivacea* Pils. In more secluded spots, several specimens of *Pleurocera brumbyi* Lea were also taken. These specimens were much larger than those found in other streams in this vicinity. A hand-dredge brought from the oozy bottom numerous beautiful clear specimens of *Pisidium sp.* *Physa halei* Lea and *Limnaea desidiosa* Say were found in considerable numbers. A single young specimen of *Planorbis trivolvis* Say, and a single valve of *Sphaerium* indicated their presence, although no good specimens were taken. Several dead specimens of *Campeloma coarctatum* Lea also came to light.

* * * * * * * * * *

A two-hour hunt for *Helix carolinensis*, made December 1, upon the timbered flats of the Paint Rock River, resulted as follows: *Helix obstricta* Say, var. 4. Binn = *H. carolinensis* Lea, 59. *H. inflecta* Say, 22. *H. thyroides* Say, 13. *H. stenotrema* Fér., 3. *Zonites laevigatus* Pfr., 1, *Z. acerrus* Lewis 2. *Patula alternata* Say., var. *mordax* Shutt, 4. *Selenites concava* Say, 1 *Limacidae*, 8. A little later in the season, these flats will be inundated most of the time for several months. A visit to the same station a little earlier than this last year, yielded about the same results.

NOTES ON SOME NEW ZEALAND LAND AND FRESH WATER MOLLUSKS.

BY HENRY SUTER.

1. *Ancylus woodsi* Johnston. About one year ago, I discovered a small Ancylus in the River Avon, near Christchurch, which I recognized as being identical with *A. woodsi* from Tasmania. This was, to my knowledge, the first Ancylus ever found in New Zealand, and I mentioned the fact in Crosse's Journ. de Conch., vol. 32, p. 248. I can not recognize *Ancylus dohrnianus* Clessin as a New Zealand species, as long as Clessin can not give the exact locality where his species has been found, and thus enable us to verify its occurrence in this colony. There is no such Ancylus known to New Zealand conchologists, and it therefore will only help to swell the already large list of shells erroneously ascribed to New Zealand.

Only a few weeks ago, I collected a good number of *A. woodsi*, and this time alive. To my great astonishment I found several specimens with a septum more or less in process of formation, so that there could be no doubt but that this mollusk is not an Ancylus at all, but a *Gundlachia*. This was further confirmed by examining the radula, which perfectly corresponds with the radula of a Gundlachia collected and kindly sent to me by my friend, Dr. V. Sterki, of New Philadelphia, Ohio. Having come into possession of some literature on Tasmanian mollusks, I now find that Johnston, in his description of *A. woodsi* (Proc. Roy. Soc. Tasm., 1878, page 25) says: "Animal and teeth almost similar to *Gundlachia petterdi*." And in the description of *G. petterdi* (l. c. page 23) he writes: "In the young state the shell is simple, and resembles the common Ancylus." I really do not understand why Johnston established the n. sp. *A. woodsi*, when he must have been fully aware of the fact that it

was a young Gundlachia! In his list of Tasmanian mollusca, 1890, he simply drops his *A. woodsi* without mentioning that it is a young Gundlachia. I have not yet found full-grown specimens of our *Gundlachia*, but I hope to succeed later on, and it is to be expected to be a similar form to *G. petterdi* Johnston.

Prof. Hutton suggested to me that this *Gundlachia* might, perhaps, have been introduced from Tasmania on aquatic plants, which were used in packing trout ova, and as our fish-hatching ponds are in communication with the river Avon, there is all possibility of this being really the case. However, there is one objection. Up to the present day I found our *Gundlachia* only on aquatic plants in the lower parts of the river, from the outflow of Horseshoe Lake to New Brighton, but not upward between this outflow and the fish-hatching ponds. This makes it very likely that *Gundlachia* occurs in the swampy Horseshoe Lake, difficult of access, and was washed down in the river Avon when the canal was cleared from *Anacharis* weeds. If this mollusk is really indigenous, it will, no doubt, be found in localities where the introduction from Tasmania is out of question, but as long as this is not the case, we must remain doubtful on this point.

In the "Reference List" I published with my friend Mr. Ch. Hedley, of Sydney (Proc. Linn. Soc. N. S. W., vol. VII (2) p. 624), he put down *Ancylus tasmanicus* Tenison-Woods, as being synonymous with *A. woodsi*. This is wrong, as the former is quite different, and I believe it to be really an *Ancylus*. *A. australicus* Tate and *A. smithi* Cox are very likely also young forms of *Gundlachia*. *A. assimilis* Pett. and *A. oblonga* Pett. I have not seen. It would be of highest interest to examine the dentition of the Caledonian *A. reticulatus* Gassies and *A. noumeensis* Crosse, which Mr. Hedley thinks to be nearly allied to the so-called *A. woodsi*.

2. *Rhytida meesoni* Suter (Reference List, l. c. page 631) is no *Rhytida*, but a *Paryphanta*, as the animal lays calcareous eggs, whilst the genus *Rhytida* is considered to be viviparous. The genera *Paryphanta* and *Rhytida* are in the shells, the exterior of the animals and the radula so nearly allied, that it is not always easy to separate them. Very likely the genital organs will show generic differences, and it is my intention to study the anatomy of these genera as soon as opportunity offers and time permits.

3. *Thalassohelix ziczac* Gould. There was always some doubt whether this shell was really a New Zealand species or not, and at

the request of Mr. Hedley, when we worked out our "Reference List," I tried to solve the question. I came to the conclusion that *Th. portia* Gray must be the same species, and therefore they appear as synonyms in our list. I then selected two perfectly similar specimens, and sent one to Mr. Edg. A. Smith of the Brit. Museum for comparing it with Gray's type of *H. portia*, the other to Dr. Dall, Washington, to compare it with Gould's type of *H. ziczac*. Both gentlemen very kindly acceded to my request, and I herewith wish to express my gratitude to them.

Mr. Edg. A. Smith writes: "*Helix portia* Gray. Right, but I doubt if Gould's *ziczac* is the same species." And Dr. Dall reports: "There is no doubt whatever of the identity of your shell with Gould's type. He, in his preliminary report (Otia Conch., p. 17), refers it to New South Wales, but in his final report (Moll. U. S. Expl. Exp., p. 41), he says that it was collected by Dr. Pickering in a crater at Taiamea, New Zealand. His type was a little faded, hence the prominence of the dark variable lines and the straw color of the shell." These reports set all doubts at rest.

4. *Thalassohelix zelandiæ* Gray. In a letter to me, Mr. H. A. Pilsbry expressed his opinion that the shell Prof. Hutton and I considered to be Gray's *Hel. zelandiæ* might, perhaps, be another species. I therefore forwarded a specimen to Mr. Edg. A. Smith, and he kindly compared it with Gray's types. His opinion is as follows: "The shell under this name is, I think, a form of that species. It is larger than any of our typical examples and more brightly variegated, and the whorls are perhaps, a trifle flatter, still I think it is only a variety." To this I would remark that most species of *Thalassohelix* are subject to great variation, and I am confident that we identify the right shell as *Th. zelandiæ* Gray.

5. *Endodonta varicosa* Pfeiffer, I considered to be synonymous with *E. timandra* Hutton (Reference List, l. c., p. 651). Mr. H. A. Pilsbry, however, denies their identity (Man. Conch. (2) VIII, p. 84), and I therefore also sent specimens of *E. timandra* to Mr. Edg. A. Smith for comparing them with *varicosa* Pfr. He kindly sent me the following information: "*E. timandra* Hutt. This is *distinct* from *varicosa* Pf. It is smaller, more openly umbilicated, has more riblets, and the armature of the mouth is different. There are three teeth in *timandra* and *one* (overlooked by Pfeiffer and Reeve) in *varicosa*, situated on the body-whorl. It is a very slender lamella, and might easily be overlooked." After receiving this report, I

looked all specimens of *E. timandra* in my collection carefully through, and had the great satisfaction to find a few specimens of *E. varicosa* Pf. The two species differ in the characters mentioned by Edg. A. Smith; however, I have one specimen of *E. varicosa* with two lamellae in the body-whorl. If not very carefully examined, the two species may very easily be confounded. It seems that *E. timandra* occurs only on the North Island, while *E. varicosa* seems to be limited to South Island.

6. *Charopa sylvia* Hutton. I thought this species to be identical with *Ch. tau* Pfeiffer (Ref. List., l. c., p. 657), but felt always more or less doubtful. I therefore sent specimens with the others to Mr. Edg. A. Smith, and he very kindly wrote to me: "*Ch. sylvia* Hutt. You question this being the same as *Hel. tau* Pfr. We have not yet the latter in the Museum, but Pfeiffer's description of the sculpture '*subdistantum costato-plicata*' scarcely applies to your specimens. They are undoubtedly identical with Pieiffer's *Hel. gamma*. I have compared them with the types, and they agree in every respect, excepting that yours are fresher." Therefore:

Charopa buccinella Reeve, sp., 1852 (=*gamma* Pfeiffer, 1852 (? 1853) = *sylvia* Hutton, 1883).

Now it remains to identify *Ch. tau* Pfr. It may be that my *Charopa mutabilis* is this species; I have sent a specimen to Vienna to have it compared with Pfeiffer's type, and am awaiting a report.

New Zealand, Christchurch, Sept. 6, 1893.

SHELLS OF THE SAGINAW VALLEY, MICHIGAN.

BY BRYANT WALKER, DETROIT, MICHIGAN.

Some twenty-five years ago the late Dr. George A. Lathrop, while residing at East Saginaw in this State, made a considerable collection of the shells, which he found in that vicinity.

After lying packed away for many years, the collection has recently come into my possession, and as it contains some material of considerable interest, and no local catalogue from that part of the State has ever been published, the following list of the species represented has been deemed worthy of a permanent record.

I am indebted to Dr. V. Sterki for the determination of the Pupidæ and to Mr. A. A. Hinkley for the identification of Goniobasis

semicarinata Say and depygis Say. Unless otherwise specified the locality is in all cases East Saginaw.
Selenites concavus Say.
Zonites nitidus Mull.
Zonites indentatus Say.
Zonites arboreus Say.
Zonites minusculus Binn.
Zonites radiatulus Alder.
Zonites fulvus Dr.
Zonites multidentatus Say. Heretofore cited only from the western part of the State.
Patula alternata Say.
Patula perspectiva Say.
Patula striatella Anth.
Patula lineata Say.
Punctum pygmæum minutissimum Lea.
Helix multilineata Say.
Helix thyroides Say.
Helix albolabris Say. Above the average in size and one example an almost perfect albino.
Helix albolabris dentata.
Helix exoleta Binn.
Helix sayii Binn. Port Austin. A new locality for this (in Michigan) rare species.
Helix mondon fraterna Say.
Helix leaii Ward.
Helix tridentata Say.
Helix palliata Say.
Helix virgata Da Costa. A single well marked example of this species, apparently of the variety called "*alba*" by Taylor, occurs in the collection with the following label: "From Dr. Clark of Flint, Michigan, where he says it was found." Dr. Clark was a well known physician of Flint in times past; but as both he and Dr. Lathrop are dead, it is not probable that any further information in regard to the circumstances under which this shell was found can be had. The specimen though mature, is not quite fresh, and as the body whorl was filled with hard packed fine sand it seems very probable that it was imported in the earth about some foreign plants.
Vallonia pulchella Mull. Determined by Dr Sterki.
Strobilops labyrinthica Say.
Pupa corticaria Say. These are the first specimens seen from the eastern part of the State.

Pupa armifera Say.
Pupa contracta Say.
Vertigo ovata Say.
Vertigo gouldii Binn. Quite abundant apparently, and exhibiting some considerable variation in size. A single albino example is included, of which Dr. Sterki writes "This is a very interesting and valuable specimen ; the only true albino among many thousand specimens of our Vertigos I have seen."
Vertigo ventricosa elatior Sterki. Not heretofore known from Michigan.

Vertigo pentodon Say.	Vertigo curvidens Gld.
Ferussacia subcylindrica L.	
Succinea oblivua Say.	Succinea peoriensis Wolf.
Succinea avara Say.	Succinea sp.
Succinea ovalis Gld.	Succinea sp.

There are four forms of *Succinea* in the collection, which group around *S. ovalis* Gld. as a type. The first is the form usually called *ovalis* characterized by the short; rather blunt spire, elongated body whorl and effuse aperture. The second is the peoriensis of Wolf, a very widely extended form in Michigan and easily separated from the "*ovalis*" by reason of the shorter body whorl and more nearly oval aperture, which though somewhat narrowed posteriorly lacks the patulous expansion anteriorly so characteristic of the former. The third resembles *ovalis* in the shape of the aperture, but is a more slender shell and has the spire more elongated than either the preceeding forms. It appears to range generally over the State and is the same form noticed as "S. higginsi Bld." in my catalogue of Michigan shells (NAUT. VI, p. 19).

The fourth form is quite remarkable. Having the general shape, characteristic of the group, it far exceeds them all in dimensions, equalling in length a good sized *S. obliqua* Say. These shells were labeled by Dr. Lathrop as "*S. sillimani* Bld.?" They agree substantially in form and size with figures of that species given by Binney. Some individuals, however, have the spire more produced, resembling in that respect the figures of *S. hawkinsi* Bd.; but the suture is not impressed to the extent represented in that species. None of them have the blunt apex, which seems to be characteristic of *S. haydeni* W. G. Binn., though fully equalling that species in size. Cockerell (NAUT. VI, pp. 23 and 29) refers all these forms to the *S. elegans* Risso of Europe. It is possible that these specimens

are similar to the Canadian examples, which he refers to that species.

Carychium exiguum Say.

Limnæa stagnalis L.

Limnæa catascopium Say.

Two forms of this species are represented in the collection. One from the Saginaw River is of the usual form, but of unusual size, one example being nearly one and one-fourth inches in length.

The other form from Saginaw Bay is characterized by its greatly inflated body whorl and very short, rapidly acuminating spire. A single specimen from Lake Huron represents the form usually found in the Great Lakes.

Limnæa reflexa Say. Bayou, East Saginaw and Saginaw Bay. The latter somewhat smaller and more slender than the former.

Limnæa reflexa scalaris. Intermediate between the type and the variety.

Limnæa palustris Mull. Larger than the average in size. The striped variety corresponding to form of *L. reflexa* known as *zebra* Tryon, is also represented.

Limnæa cubensis Pfr.

Physa ancillaria Say. Saginaw Bay.

Physa sayii Tapp.

Physa gyrina hildrethiana Lea.

Aplexa hypnorum L.

Planorbis trivolvis Say.

Planorbis bicarinatus Say.

Planorbis campanulatus Say.

Planorbis albus Mull.

Planorbis exacutus Say.

Planorbis parvus Say. Among a number of the usual form of this species occurs one of the curiously distorted examples, in which the whorls almost from the apex are entirely detached from each other and coiled obliquely like a ram's horn.

Segmentina armigera Say.

Ancylus fuscus Ad. Saginaw River.

Ancylus parallelus Hald. Saginaw River. Much narrower and with the sides more flattened and hence more nearly parallel than in specimens from other localities.

Lyogyrus pupoidea Gld. Heretofore this species has been cited only from the western part of the State.

Campeloma decisa Say. Cass River.

Amnicola porata Say.

Bythinella obtusa Lea.

Goniobasis livescens Mke. Saginaw Bay.

Goniobasis semicarinata Say. Saginaw River.

This is the first time this species has been cited from this State.

Goniobasis depygis Say. Saginaw River.

This species, although cited in the earlier lists of Sager and Miles, has not been found by any of the more recent collectors.

Goniobasis milesii Lea. Cass River.

Two specimens "from Dr. Miles," which seem to justify Tryon's doubt as to whether the species is more than a globose form of *G. livescens* Mke.

Unio alatus Say. Saginaw River.

Unio asperimus Lea. Saginaw River. This is the first recorded occurrance of this species in the eastern part of the State. It may be of interest to add that Dr. W. H. DeCamp of Grand Rapids informs us that the species has also been recently found in the Grand River, so that the doubt formerly cast upon its occurrence in Michigan must be considered as entirely removed.

Unio cornutus Bar. Another addition to the fauna of the eastern part of the State. One example, probably a female, is unusually elongated.

Unio ellipsis Lea. This and all the following species are from Saginaw River.

Unio gibbosus Bar.
gracilis Bar.
ligamentinus Lam.
luteolus Lam.
nasutus Say.
novi-eboraci Lea.
phaseolus Hild.
rectus Lam.
rubiginosus Lea.
schoolcraftii Lea.
ventricosus Bar.

Margaritina deltoidea Lea.

Anodonta benedictii Lea.
footiana Lea.
imbecilis Say.

Sphærium striatinum Lam.
rhomboideum Say.
occidentale Pme.
partumeium Say.
truncatum Lam.

Pisidum virginicum Lam.
abditum Hald.
compressum Pme.
variabile Pme.

NOTES AND NEWS.

Mr. John Ritchie, Jr. of Boston paid a short visit to his conchological friends in Philadelphia Feb. 3d and 4th, being the guest of Mr. Ford.

Tulotoma in the Tennessee Drainage.—As the Paint Rock River is a tributary of the Tennessee and hence in the Ohio drainage, it may be of interest to note that a fossil specimen of *Tulotoma magnifica* Con. was recently found about 20 miles from its mouth. *T. magnifica* is a living species of the lower Coosa.—*H. E. Sargent, Woodville, Ala.*

Rev. Samuel Lockwood, Ph. D., well known in New Jersey as an enthusiastic student of the Natural History of the State, died at his residence in Freehold, N. J., on Jan. 10th.

Some Final Remarks Relative to Cypræa Greegori, Ford. —Since Mr. Smith has, in the January number of the Nautilus, deemed it expedient to make a purely scientific subject, the vehicle of remarks chiefly personal in character, it is just possible that comment is uncalled for from me. It might be prudent, however, to notice one or two of the gentleman's statements, especially that touching the ease with which he could take Mr. Ford's paragraphs *seriatum*, and confute them, etc. In respect to this show of confidence, I have nothing to suggest beyond referring him to the following not very classic, but rather trite saying, viz.: "The man who is always sure that he could have managed things better had be been there, is usually the one who never gets there."

Regarding the quoted phrases so pathetically alluded to by the gentleman, I cannot believe that any reader save himself ever supposed they were presented as parts of his communication.

Certainly such a thought never occurred to me. The "inverted commas" were added to them simply as evidence of their general use. Was this fact apparent to Mr. Smith? Perhaps not, and yet —Perhaps.

As my reasons for claiming priority for the name *C. Greegori* were fully explained in the Nautilus for Nov., 1893—and as the justice of this claim has been heartily conceded by very many of our ablest conchologists, I do not propose inflicting the reader with any further

remarks on the subject, now or hereafter.—*John Ford, Philadelphia, Jan.*, 1894.

The collection of DR. WM. D. HARTMAN of West Chester, Pa., is offered for sale. It is one of the richest in America in Melanians, *Partula, Achatinella, Bulimus*, etc., and comprises the types of Dr. Hartman's new species, as well as duplicate types from Lea, Anthony, Wheatley, and many other conchologists. It will prove a very valuable collection to whoever may purchase it.

NOTES ON NEW PUBLICATIONS.

PRELIMINARY REPORT ON THE MOLLUSCAN SPECIES *collected by the U. S. Scientific Expedition to West Africa in* 1889–90, pp. 32.

ON RARE OR LITTLE KNOWN MOLLUSKS *from the west coast of North and South America with descriptions of new species*, pp. 11 and plate.

REPORT ON THE MOLLUSK-FAUNA OF THE GALAPAGOS ISLANDS, *with descriptions of new species* etc., 97 pp., plate and map.

The foregoing are the titles of recent papers on Mollusca by Dr. Stearns published in the proceedings of the U. S. National Museum, in Volume XVI, which includes the various articles for the year 1893. The first of the above, is an annotated catalogue of the shells collected by the Eclipse Expedition so-called, that went to the west coast of Africa for the purpose of observing the total eclipse of the sun, that occurred on the 22nd of December 1889. The Natural History work was of course incidental; it includes also the forms collected at the Azores, where the *Pensacola* touched on her way. The total number of molluscan species collected foots up 120, the greater portion, over one hundred, at various African points, Ascension Island and Cape de Verde, etc. Several of the species are shown to have a wide distribution, from the Gulf of Mexico and the Caribbean waters to the African region; and *Trochatella radians* "not before reported outside of Peru and Chili," was detected, a single example, at Cape de Verde; many other forms have nearly as wide a range.

The second paper embraces several forms, some of which were preliminarily described in "The NAUTILUS" in May, 1893. Many

species of a decided Polynesian aspect are reported from the Gulf of California region; among these are *Chicoreus palmarosæ mexicana, Ranella cruentata, Purpura hippocastanum, Casmaria vibex* and *Luponia isabella mexicana.* This paper includes also revised descriptions of species previously described by the author, notably, *Dolabella californica, Onchidella binneyi = O. carpenteri* Stearns not Binney, etc. A new species of *Tectarius, T. atyphus,* the first of this group detected on the West Coast is described; it occurs at Manta on the coast of Ecuador. Other species are referred to and commented upon.

The last of the foregoing titles relates to a paper hitherto briefly noticed in "The NAUTILUS," (December, 1893). This includes a list of Galapagos shells, compiled from the collections made by the *Albatross,* Dr. Habel, Dr. Wolf, the *Petrel,* Dr. W. H. Jones and the papers and publications of Carpenter, Albers, E. A. Smith, Wimmer, Ancey, Reibisch, Dall, etc., etc. The *Albatross* collectors obtained 109 species and several varieties; of these 59 were not before reported as occurring at the Galapagos. A few new species were detected and are described by the author. The total as shown in the summarized list is 288 species and 30 varieties.

The land shells are of a distinctly West American type, comparable with Chilean and Peruvian forms, and with the exception of half a dozen local species, the marine forms are West American—with a slight color of Caribbean or Antillean types.

NOTES ON RECENT COLLECTIONS OF N. A. MOLLUSKS, ETC., by R. E. C. Stearns (Proc. U. S. Nat. Mus. 1893). Dr. Stearns records numerous new localities for various land and fresh-water shells, discussing particularly the range of *Patula strigosa Hemphilli,* and its occurrence in Arizona at Coon Mountain, that problematic crater. *Triodopsis Levettei* is reported from Fort Huachuca and Tucson Arizona (a large form). Ft. Huachuca is so near the Mexican boundary that Stearns believes both *P. hemphilli* and *T. Levettei* will eventually be found in the Mexican state Sonora. *Helicina orbiculata* was collected by Mr. V. Bailey near Marble Cave, Stone Co., Mo., probably near its northern limit. Attention is called to the discontinuous distribution of the section *Mesodon,* which is represented by several western species, among them *townsendiana* and *ptychophora*; records of North Dakota and eastern Montana localities for *Mesodon* are still lacking. In this tract *multilineata* and *thyroides* are to be expected, we think, but suitable stations are not very numerous west of Minnesota and Iowa.

THE NAUTILUS.

VOL. VII. APRIL, 1894. No. 12

THE CALIFORNIAN SPECIES OF THE GENUS NUTTALLINA.

BY W. J. RAYMOND, OAKLAND, CALIFORNIA.

In the Manual of Conchology, Vol. 14, p. 280, after directing attention to the differences existing between *Nuttallina californica* Nutt. and *N. scabra* Rve., Mr. Pilsbry remarks that data are desirable concerning the areas of distribution of the two species along the Californian coast, especially between San Diego and Point Piedras Blancas, near San Simeon. Having collected numerous specimens of this genus at various points between Bolinas and Santa Barbara, I can offer the following notes.

A glance at a map of the West Coast will recall certain geographical features bearing upon the distribution of marine life. Going southward from San Francisco, the coast line which has followed a general southeasterly direction, bends abruptly to the east at Point Concepcion. As a result of this, the great ocean current from the north which has held to a course near the coast and parallel with it, all the way from Alaska, leaves it for the first time and flowing southward, is still further deflexed by the chain of the Santa Barbara islands. From Point Concepcion eastward, the ocean is warmer and the other conditions surrounding marine life are such as to warrant the expectation of an assemblage of species, different from those found north of the cape. While many species of mollusks are common to our whole Californian coast, *Terebra simplex, Drillia hemphilli, Marginella varia, Cypraea spadicea, Trivia solandri, Turritella cooperi, Norrisia norrisii, Trophon belcheri, T. triangulatus, Periploma planiuscula* and *Barbatia gradata* are species of a more southern fauna, found in Santa Barbara county, which do not as far

as we know pass Point Concepcion. Many other examples might be noted.

This is not the place to enter into a discussion of the West Coast marine faunal provinces. But it is interesting to note that as far as the material at hand gives evidence, the two West Coast species of *Nuttallina* are sharply divided by this natural boundary. At Carpinteria, ten miles east of Santa Barbara and at points west of that town, to Santa Anita, within ten miles of Point Concepcion, the specimens are uniformly *N. scabra*, as are also the more southernexa mples of the genus. Specimens collected at Point Sal, thirty-five miles northward from Point Concepcion, together with those collected at San Simeon, at Monterey, at Purissima and at points near San Francisco are uniformly *N. californica*. No intregrading forms were observed. While the external appearance is not always a sure guide to specific position, disarticulation of the plates has, in all cases examined, revealed the species with certainty.

A study of numerous specimens from the localities mentioned, shows the following differential characteristics, in addition to those cited by Mr. Pilsbry. Whether they would hold good in specimens from other localities or not, I do not know. In color *N. scabra* is externally more varied than *N. californica*. Specimens of the former from Santa Barbara are clouded and mottled with greenish upon a buff ground-tint, on the second, third, fifth and sixth valves. The remaining valves are much darker and less variegated. In single valves of *scabra*, viewed from above, the broad curving outline of the tegmentum on each side is bordered by a small spot of brown, placed centrally on the light blue surface of the sutural plates. This feature is constant in all of the specimens examined. In *N. californica* the spots are wholly absent, or in some cases replaced by indistinct clouds of a color darker than the surface of the sutural plates. Of course no one would separate the species because of these slight color differences, but taken in conjunction with the weightier points of difference furnished by the shape of the plates, sculpture and character of the girdle, they are interesting as showing how far these geographical races have become differentiated from the parent stock.

LAND AND FRESH-WATER SHELLS OF ALLEGHENY COUNTY, PA.

COLLECTED BY S. H. STUPAKOFF OF PITTSBURGH, PA., FROM JAN., 1890 TO DEC., 1893.[1]

Mesodon albolabris Say.
Mesodon var. dentata Binn.
Mesodon dentifera Binn.
Mesodon profunda Say.
Mesodon pennsylvanica Green.
Mesodon thyroides Say.
Mesodon exoleta Binn.
Triodopsis tridentata Say.
Triodopsis palliata Say.
Triodopsis fallax Say.
Stenotrema monodon Rack.
Stenotrema var. fraterna Say.
Stenotrema hirsuta Say.
Helicodiscus lineata Say.
Vallonia pulchella Mull.
Vallonia excentrica Sterki.
Patula alternata Say.
Patula solitaria Say.
Patula perspectiva Say.
Patula striatella Anthony.
Punctum pygmæum minutissimum Lea.
Selenites concavus Say.
Mesomphix fulginosus Griff.
Mesomphix ligerus Say.
Mesomphix intertextus Binn.
Mesomphix inornatus Say.
Hyalina arborea Say.
Hyalina indentata Say.
Hyalina minuscula Binn.
Hyalina milium Morse.
Hyalina radiatula Alder.
Hyalina wheatleyi Bld.
Conulus fulvus Drap.
Gastrodonta multidentata Binn.
Ferussacia subcylindrica Linn.
Leucocheila contracta Say.
Leucocheila armifera Say.
Vertigo ovata Say.
Vertigo pentodon Say.
Vertigo milium Gld.
Succinea avara Say.
Limnæa columella Say.
Limnæa humilis Say.
Limnæa palustris Müll.
Limnæa desidiosa Say.
Planorbis bicarinatus Say.
Carychium exile Lea.
Carychium exiguum Say.
Helicina occulta Say.
Physa heterostropha Say.
Ancylus fuscus Adams.
Sphærium striatinum Lam.
Pisidium ?
Goniobasis ?
Margaritana rugosa Barnes.
Unio ligamentinus Lam.
Unio gibbosus Barnes.
Unio ellipsis Lea.
Unio cariosus Say.
Unio pyramidatus Lea.
Unio trigonus Lea.
Unio alatus Lea.

[1] The present list is the first essay toward a knowledge of the snail fauna of western Pennsylvania. The region is an interesting one, combining the features of the Atlantic slope and the Ohio valley; and it is desirable to have a complete and accurate catalogue of the fauna. The fresh-water fauna will prove especially interesting, as we know little of the range of the Ohio River types of Unionidæ and Strepomatidæ in the headwaters of that river system.—ED. NAUTILUS.

In addition to the above the following species were collected by Mr. Geo. H. Clapp; these complete to the present date all the species found in Allegheny County, Pennsylvania.

Strobila labyrinthica Say.
Mesodon clausa Say.
Mesomphix lævigatus Pfr.
Gastrodonta suppressa Say.
Vitrina limpida Gld.
Vertigo bollesiana Mse.
Pupa corticaria Say.

A NEW PAPUINA.

BY CHARLES HEDLEY, SYDNEY, AUSTRALIA.

Papuina cerea Hedley.

Shell thin, translucent; contour trochoidal, color waxen white, becoming yellowish on the 3rd and 4th whorls, encircled below the suture by an opaque white thread, *nowhere are translucent lines or spaces visible.* Sculpture: surface of a waxen polish; transverse growth lines can be detected by the unaided eye, and spiral grooves, almost effaced above but plainer on the base, may be deciphered with a lens. Whorls 5½, flattened, regularly increasing, the last constituting five-eighths of the shell's height, angled at the periphery, descending considerably and abruptly at the aperture, gibbous at the point of flexure. Suture impressed. Aperture very oblique, anterior margin waved; *columella* oblique, wide, *extending nearly to the angle of the aperture, subtruncate below.* A thin, translucent, shining callus extends over the imperforate axis to the insertion of the anterior margin of the lip.

Height 13½, major. diam. 16, min. diam. 14 mm.

Hab. Bloomfield River, North Queensland.

ON THE SPECIES OF MACTRA FROM CALIFORNIA.

BY WM. H. DALL.

In revising the Tertiary *Mactracea* of the southeastern United States, it became necessary to examine the recent species and work

up their synonymy. The species of the Pacific coast especially have long been known to be in a very bad state as regards nomenclature, etc. Several long known forms appear, on investigation, to be really nameless, the titles belonging to other less conspicuous species having been applied to them, while some of the earliest named forms have been lost sight of. I hope to furnish the NAUTILUS, shortly, with synonymic lists of the east and west coast Mactras, pending the completion of which the following descriptions are offered.

Mactra catilliformis Conrad. Pl. V, fig. 3.

Shell large, thin, whitish or straw color, irregularly concentrically striated, with a gray, wrinkled epidermis, inflated short-oval subequilateral valves and closely adjacent inconspicuous beaks; anterior end of shell evenly rounded in front, a little shorter than the posterior end; lunule narrow, impressed, escutcheon narrow, longer, rather obscure; posterior end of valves rounded, slightly compressed and with a narrow gape when closed; hinge resembling that of *M. polynyma* Stm., but more concentrated, cartilage pit large, rather produced; posterior muscular impression larger, pallial sinus rather large, rounded in front. There is a faint posterior flexure of the valves and a feebly marked area above it, on which the epidermis is more conspicuous. Lon. 108·0, alt. 87·0, diameter 45·0 mm., in a moderately sized pair, but the adult reaches 140·0 mm. in length.

Distribution: Neeah Bay to San Diego, Cala.

This is *Standella californica* Carpenter, but not of Conrad or Deshayes. It was imperfectly described without a figure by Conrad in the Am. Journ. Conch. vol. iii, p. 193, 1867, and erroneously stated to come from Panama. *M. lenticularis*, Gabb, 1866, from the Miocene of California is closely related.

Mactra Hemphillii n. s. Pl. V, fig. 2.

Shell large, thin, inflated, subequilateral, creamy white with a yellow thin epidermis, which over the body of the shell in young shells is beautifully evenly concentrically striated and on the posterior dorsal area is irregularly wrinkled, with an elevated raphe of epidermis at the margin of the area; beaks rather prominent, the anterior end of the valves longer than the posterior; posterior dorsal slope excavated; lunule obscure, escutcheon marked by prominent elevated radial lines of epidermis; the dorsal margin pouting in front of the ligament, the posterior slope convex, the posterior flexure

faint, but marked by a recession of the ventral border of the valves, which gape but very little and not at all in front; anterior end rounded, but smaller than the posterior; ventral border arcuate; hinge and pallial sinus much as in the last species, except that the sinus is somewhat smaller and less depressed. Lon. 120, alt. 93, diam. 50 mm.

Distribution: San Diego, Hemphill and Cooper.

This fine and perfectly distinct species appears rare and I have seen but two specimens, both from San Diego.

The preceding species belong to the subgenus *Standella* as adopted by H. and A. Adams, but the following is a true *Mactra*, with the ligament separated from the cartilage pit by a shelly plate.

Mactra dolabriformis Conrad, 1867. Pl. V. fig. 1.

Shell much compressed, polished white under a dull brown epidermis, subequilateral with inconspicuous beaks. It closely resembles *M. falcata* Gould (from type) but has higher beaks more centrally set, the anterior end more attenuated and less truncate, the left anterior lateral tooth single and distally more prominent; the left cardinal larger and wider; the posterior adductor scar horizontally elongate and smaller. Lon. 90, alt. 63, diam. 26 mm.

Distribution: San Diego, Cala. to Guaymas, Mexico; "Panama" Conrad.

This remarkably handsome shell has not unnaturally long been confounded with *M. falcata*, from which the hinge separates it subgenerically.

The true *M. californica* of Conrad is a *Mactrinula* and can at once be recognized by its sulcate beaks. It reaches 36 mm. in length. The *M. planulata* is also a small species, resembling *M. polynyma* in miniature. The northern form generally referred to *M. falcata* is a barely separable variety of *M. polynyma* which may take the name of *Alaskana*.

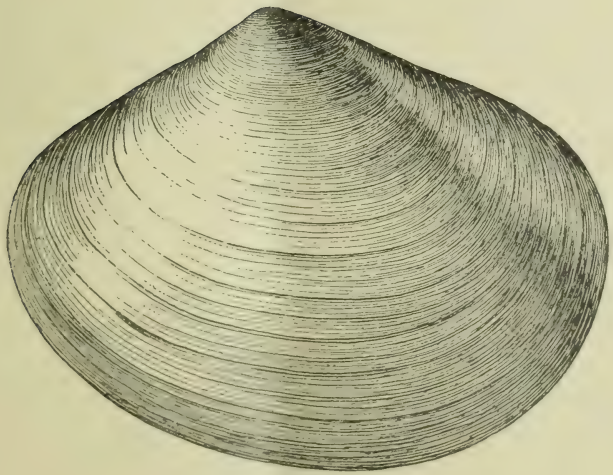
NOTICES OF NEW CHITONS, III.

BY H. A. PILSBRY.

Certain rectifications of the previously accepted nomenclature have become necessary, and may be made here.

No.1.

No.2.



No.3.

DALL.—Californian Mactridæ.

Genus Phacellozona Pilsbry (new name).

Synonymy: *Angasia* Cpr., Table Reg. Chitons, 1873. Dall, Proc. U. S. Nat. Mus., 1881, pp, 283, 286, 289, 290. Pilsbry, Manual of Conchology, XIV, p. 286.

Not *Angasia* White, Proc. Zool. Soc. Lond., 1863, p. 498 (Crustacea).

The type of the genus will, of course, remain *Angasia tetrica* Cpr.

Genus Choriplax Pilsbry (new name).

Synonymy: *Microplax* Ad. & Ang., Proc. Zool. Soc. Lond., 1864, p. 194. Pilsbry, Manual of Conch.. XIV, p. 21.

Not *Microplax* Fieber, Europ. Hem., p. 53, 1861 (Hemiptera).

Type *Microplax grayi* Ad. & Ang. This is an extremely peculiar and isolated genus, and forms, I am disposed to believe, a distinct family of the *Eoplacophora* or slitless Chitons—that is, if the slits really prove to be completely absent, for the unique type has not been disarticulated. In some features it recalls the *Acanthochitidæ*. The single species was described and illustrated from the unique type in the British Museum, in the Manual of Conchology, vol. XIV.

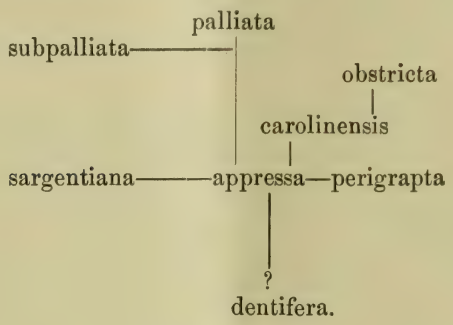
DESCRIPTIVE NOTES ON CERTAIN FORMS OF POLYGYRA.

BY H. A. PILSBRY.

The genus *Polygyra* is one of the most numerous and characteristic groups of North American land snails. It ranges over the whole of the Eastern United States, from Canada to Florida, and from Manitoba to Yucatan, with species in Idaho and on the Pacific slope. A few stragglers have reached Cuba, the Bahamas and Bermuda.

Many of the species exhibit a great amount of variation, and in some cases the variations of several allied species form chains of mutations almost or quite connecting very unlike species. This is the case in the group of *Polygyra appressa*. Typical *P. appressa* is a snail having the aperture three-toothed, but the upper lip tooth is often small or wanting. It varies toward *P. obstricta* var. *carolinensis*, which is close to *P. obstricta*, and less so to *P. palliata*. In another direction *P. appressa* is allied to *P. sargentiana*. In fact, *appressa* is not far from the ancestral form from which all the spe-

cies mentioned above have been differentiated. This diagram expresses roughly the relationships of the species and varieties:



Polygyra appressa Say.

Surface striate, but having no spiral incised microscopic lines; outer lip frequently having an upper tooth, or the indication of it; parietal tooth generally long, curving downward and nearly joining the columellar lip.

This species was collected by Say on Long's Expedition. It is abundant in Illinois, Arkansas, Missouri, etc. Say's types are lost, but his description unmistakably indicates this form.

Polygyra appressa perigrapta Pils.

Surface striate and having crowded microscopic spiral incised lines, especially beneath; outer lip with no upper tooth; parietal tooth short, not connecting with columella.

Distribution mainly southern; Woodville, Ala.; Cherokee Co., N. C.; Columbus, Ga.; etc. The types are Woodville specimens.

Polygyra fallax Say.

This is, as the writer has elsewhere shown, the *H. introferens* of Bland. It is not the *fallax* of all modern writers and collectors.

Polygyra fallax obsoleta Pils.

General features as in the type, but all teeth of the aperture much reduced in size, the upper lip tooth nearly or wholly obsolete. Newbern, N. C.

Polygyra tridentata edentilabris Pils.

General characters as in the type, but lip teeth wanting in perfectly mature examples.

Polygyra hirsuta altispira Pils.

Size large; spire high and conical; notch of the basal lip very large. Alt. 7, diam. 9 mm.

Specimens are before me from near Magnetic City (Wetherby) and from the Black Mountains, N. C. (Hemphill).

REMARKS ON ASTYRIS GOULDIANA.

BY A. H. GARDNER, FORT HAMILTON, N. Y.

In a careful examination of the Columbellidæ dredged by me last summer in Long Island Sound, I find amongst specimens of *Astyris lunata*, taken from a muddy bottom with eel grass, in 2 to 3 fathoms of water in Lloyd's Harbor, 3 shells which are typical examples of *Astyris gouldiana* Agassiz *in litt.* (*fide* Stimpson) and again recorded from this same locality by Mr. Sanderson Smith in "The Mollusca of Long Island and its dependencies," Smith & Prime. The species seems to have been considered as of doubtful validity by Prof. Verrill, as in "The Invertebrate of Vineyard Sound," he includes it in the synonomy of *Astyris lunata*, referring to it as a color variety identical with the *Wheatleyi* of Dekay, but I think the characteristics of the shell entitle it to rank as a good species.

The shells measure in length 4 to 4⅓ mill., and have 8 whorls. A. lunata rarely exceeds 3 mill. and has from 6 to 6½ whorls; in *Astyris gouldiana* these whorls are more convex and inflated.

The apical termination of the shell resembles that of *Belemnitella americana*, whilst in the general outline of its whorls it is very much like the well known land mollusk, *Ferussacia subcylindrica*. The rostrum is not only much produced but is curved to such an extent in two of the specimens as to give the aperture a decidedly auriform appearance. The thick loosely appressed callus on the pillar lip of *A. lunata* is represented in this shell only by a very fine glaze. The specimens all exhibit clear zigzag markings of a brownish red, which are more pronounced than those found on any examples of *A. lunata* in my collection.

The division line between the two species seems to me to be quite sharp, both as regards size and form. I have seen no shells which

might be classed as intermediate, which would seem to confirm my conclusions.

NOTE ON PATELLA KERMADECENSIS, PILSBRY.[1]

BY GEO. W. TAYLOR.

More than a year ago a little parcel of limpets from Kermadec Islands was sent to me by a correspondent in New Zealand. They were sent by way of England and were there delayed so that they did not reach me until about a month ago.

I at once perceived that they belonged to an unknown species and I promptly sat down and wrote a note, with a diagnosis of the species for the NAUTILUS, but on a second thought decided not to be too hasty, and so instead of sending my note, I sent a specimen (a young one) of the shell itself to the Associate Editor asking him kindly to compare it with the series in the Philadelphia Museum and let me have his opinion.

I did this because I thought and still think it possible that the young shell may have been already described.

This morning I received the February NAUTILUS, and I find that some one else has a correspondent in Kermadec Island and that Mr. Pilsbry has been beforehand with me and named the new shell most appropriately, *Patella kermadecensis.*

However, as Dr. Pilsbry has only 2 specimens and I have 14, I venture to write a line or two to supplement his description.

I may say that in my opinion, the shell is very nearly related to *pica* Reeve which by the way is a South Pacific species according to the original descriptions, although Mr. Pilsbry in his "Manual" has transferred it to the Mauritius.

My suite of *kermadecensis* consists of 2 full grown shells and a series of 12 others ranging from 75 mm. down to 6 mm. in length. The large ones are respectively 130 mm. x 109 mm. x 41 mm. and

[1] This remarkable limpet seems to have been received by Mr. Taylor and Dr. W. H. Dall at about the same time. Dr. Dall sent to the NAUTILUS a description of the species under the name *P. Kermadecensis*, but after the Editors' description was already in print. Dall's description of the young and adult shells, with figures, will shortly be published in the Proc. Acad. N. S. Phila.—ED.

130x109x34 mm., being both considerably flatter than the specimens described by Mr. Pilsbry.

All my specimens are distinctly narrowed in front, and in this particular the species differs essentially from *P. patriarcha*, which is very round in outline. I have a specimen of *patriarcha* exactly the same *width* as the two shells above mentioned, namely, 109 mm., but its *length* is only 119 mm. Our species is further distinguished by its sculpture from both *patriarcha* and *mexicana*—the ribs being narrower and much more numerous than in *patriarcha* and decidedly heavier than in *mexicana*. Every 5th or 6th rib in the adult shell seems to be more prominent.

Although my shells are not badly eroded there is but little color observable outside, except in spots where smaller limpets have had their stations. In such places the peculiar burnt red color so characteristic of *P. argenvillei* is seen, and the same color, with an occasional spot of black, edges the interior of the shell and in a paler and browner shade blotches the spatula, which in the young shells is sometimes entirely brown. It would seem that the color of the interior becomes lighter with age, as is the case in many other species.

The muscle scar is, as Mr. Pilsbry remarks, strongly marked and callous in the adult shell, but in the young, it is not at all noticeable. This is the case also with the 2 species with which *kermadecensis* is compared.

On the whole this is the very finest of the many fine species of limpets that Mr. Pilsbry has made known to science during the last few years. It has no rival in size save *P. mexicana*, except it be the at present unrecognized *P. gigantea* of Lesson from the Society Islands, which may be found to be nearly allied or perhaps identical with the present shell.

NOTICES OF NEW JAPANESE MOLLUSKS, I.

BY H. A. PILSBRY.

The species described below were collected by Mr. Frederick Stearns of Detroit, Michigan, during his second visit to Japan, in 1892. They will be illustrated in his Catalogue of Japanese shells, now in preparation.

Sepia Hercules n. sp.

Shell having the general form of that of *S. esculenta* Hoyle but more convex ventrally; chitinous margin narrow; dorsal surface tuberculate-rugose as in *esculenta*, but more coarsely so, the posterior part having the tubercles very deeply separated, flat-topped, and leaning posteriorly; dorsal surface evenly rounded, with no trace of a median longitudinal rib. Ventral surface as in *esculenta*, but the striation is much closer although the shell is triple the size. Last loculus has an index of 22. Inner cone well developed, its limbs arising about one-third the length of the shell from the posterior end, gradually rising along the sides, posteriorly reflexed and appressed on the outer cone, leaving below a narrow small cavity. The anterior edge of the inner cone does not form a shelf across the posterior end of the outer cone as is the case in *esculenta*, and the cavity is much smaller, shallower and narrower than in a specimen of *esculenta* 155 mill. in length. Spine very stout, conical, its root excavated ventrally.

Length 425 mill.; greatest breadth 160 mill.; length of spine 19 mill.

This species is the giant of the genus, the shell being about 16⅞ inches long. It is allied to *S. esculenta* Hoyle, but differs as above indicated. The dorsal slope does not descend abruptly to the spine as in that species. Of *S. esculenta* a good many specimens are before me collected by Mr. Stearns. They agree well with the "Challenger" specimens. The size of *esculenta* is moderately constant, those seen by Hoyle, Appellöff and myself being from 155 to 163 mill. long (about 6¼ inches). In color, *S. Hercules* is white in the middle, faint pink at the sides; whitish beneath.

A second specimen from the Loo Choo Is. exhibits the same characters throughout.

NOTES AND NEWS.

The Rev. Geo. W. Taylor reports the appearance of *Paludina Japonica* Mart. in the Chinese Market at Victoria, B. C. These Mollusks are accounted dainties by the Chinese and are retailed to them at 25 cents a pound. The occurrence of this species in the San Francisco markets was noted by Mr. W. M. Wood in the NAUTILUS, Vol. V, p. 114.

Vol. Am. Cat. Li. Cal.

.005
2
.8

THE

NAUTILUS.

A MONTHLY JOURNAL

DEVOTED TO THE INTERESTS OF

CONCHOLOGISTS.

VOL. VIII.

MAY, 1894, to APRIL, 1895.

PHILADELPHIA:

Published by H. A. PILSBRY and C. W. JOHNSON.

INDEX

TO

THE NAUTILUS, VOL. VIII.

INDEX TO TITLES AND SPECIES DESCRIBED.

Acmæa cantharus Reeve 127
Acmæa parva Angas var. tasmanica Pilsbry, n. var. . 128
Agriolimax campestris in New Mexico 57
Amnicola olivacea Pilsbry, n. sp. 115, 95
Anodonta dejecta, rediscovered types of 52
Argonauta argo on the East Florida coast . . . 83
Buccinum undatum 78
Bulimus oblongus in St. Kitts 35
Bulimulus (Naesiotus) Reibischii Dall, n. sp. . . . 126
Bulimulus (Naesiotus) Fanneri (=Tanneri) Dall, n. sp. 127
Carychium, the American species of. (Illustrated) . . 61
Carychium exiguum var. mexicana Pilsbry . . . 63
Carychium occidentalis Pilsbry 63
Carychium exile var. jamaicensis Pilsbry . . . 63
Catalogue of the shells of Long Island, N. Y. . . . 69
Chicago Academy of Sciences, a glance at the (Illustrated). 109
Chitons, descriptive notices of new 8, 53
Chiton Hartwegii and its allies 45
Chiton (canaliculatus var.?) tricostalis Pilsbry, n. sp. . 54
Chiton aereus var. callizona Pilsbry, n. var. . . . 55
Chiton marmoreus 78
Chiton from California, a new 90
Clausilia (Stereophaedusa) stearnsii Pilsbry, n. sp. . . 47
Cyrena luchuana Pilsbry, n. sp. 30
Cyrena (papua var.?) yaeyamensis Pilsbry, n. sp. . . 30
Cyrena fissidens Pilsbry, n. sp. 30
Darina Gray 42

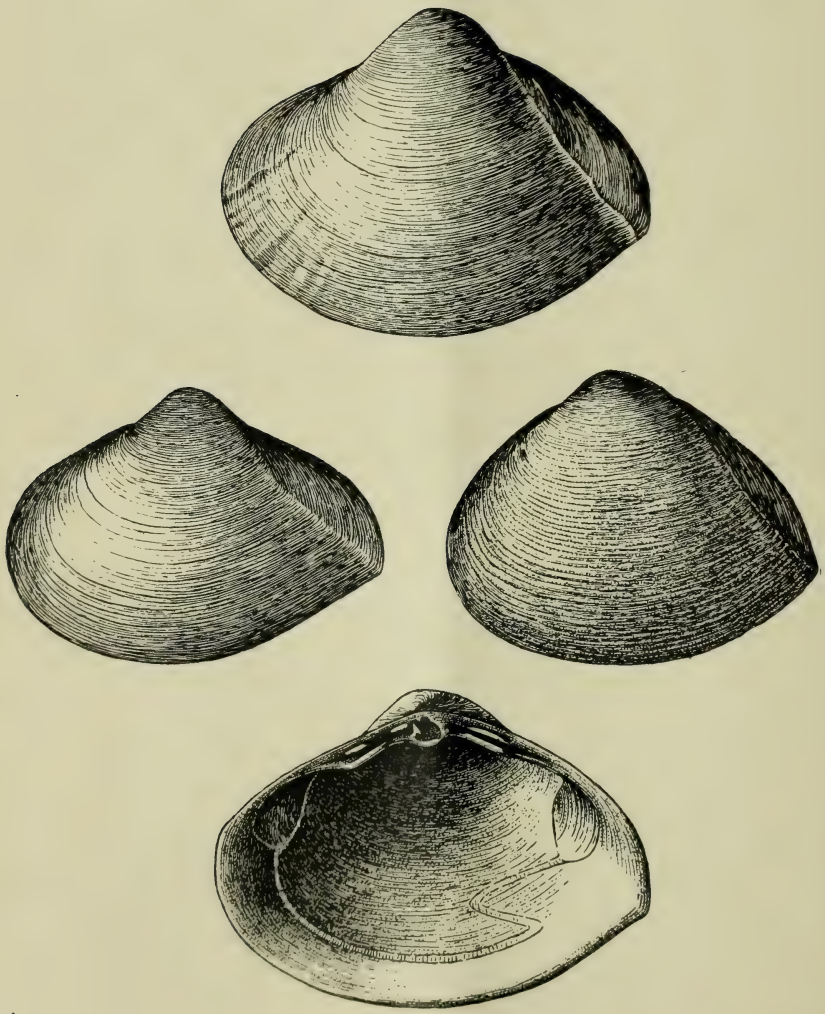
Darina declivis Cpr. 43
Dead snails 106
Doridium from Puget Sound, description of a new species of (D. adellæ Dall) 73
Eastport notes 78
Editorial correspondence from Alabama 74
Epiphragmophora ellipsostoma Pilsbry, n. sp. . . 81
Ferussacia sublindrica and two new species in Jackson Co., Ala. 104
Garlick, Mrs. D. L. (Obituary) 12
Gastrodonta (Pseudohyalina) lateumbilicata Pilsbry, n. sp. 102, 105
Gnathodon Gray 27, 41
Greegor, Isaiah (Obituary) 56
Habits of Florida littoral Mollusks 79
Haminea virescens. (Pl. II, fig. 15) 100
Helices carried by birds 72
Helices, the rate of growth of 82
Helices, new forms of western 81
Helcioniscus nigrisquamatus Reeve, note on . . 66, 91, 118
Helix (Euhadra) yaeyamensis Pilsbry, n. sp. . . . 10
Helix nemoralis, the Virginia colony of 92
Helix appressa, a few notes on 14
Helix (Arionta) coloradoensis, a new locality . . . 29
Helix tridentata, a few notes on 43
Helix gossei Pfr. 5, 71
Helix Sauliae Pfr. (non Reeve)=palumba Sowerbie . 125
Holospira pasonis Dall, n. sp. 112
Isaac Lea Chapter, Agassiz Association 10
Ischnochiton elizabethensis Pilsbry, n. sp. 9
Ischnochiton ptychius Pilsbry, n. sp. 53
Ischnochiton (Haploplax) mayi Pilsbry, n. sp. . . 128
Jamaican species of Veronicella 60
Japanese mollusks, notices of new 9, 16, 29, 47
Labiosa 27, 41
Lepidopleurus percrassa Dall, n. sp. 90
Liparus, Note on 35
List of shells collected in Jamaica 1, 19, 31
List of shells from the vicinity of Mingusville, Mont. . 63
Long Beach (California) Conchological Club . . . 95
Macroschisma Lischkei Pilsbry, n. sp. 29

Mactridae of North America, synopsis of the . . . 25, 39
Mactra Richmondi Dall, n. sp. 26, 28
Mactrella (Harvella) elegans Sowb. 28
Mactrella subalata Mörch. 42
Margarita undulata 78
Melongena corona 11
Megatebennus bimaculatus 112
Mollusca of the Paris Mains 59
Mollusks of Allegheny Co., Pa. 116
Mollusk fauna of Philadelphia and environs . . . 133
Mulinia from the Pacific Coast 5, 41
Mulinia Gray 27
Mulinia gabbi Tryon 4, 42
Mulinia modesta Dall, n. sp. (Pl. I). 5, 41
Mulinia coloradöensis Dall, n. sp. (Pl. I). . . . 6, 41
Mulinia coloradöensis var. acuta Dall, n. var. (Pl. I). . 6, 41
Mulinia Bradley Dall, n. sp. (Pl. I). 6, 41
My daily walk 33
Navanax n. gen. (Navarchus being preoccupied) . . 131
New American freshwater shells 114
New method of preventing cracking of Anodons . . 57
New species of land shells from the Galapagos Islands . 126
New publications . . . 28, 83, 96, 107, 119, 131, 144
New species of land shells from Puget Sound . . . 129
Notes and news 12, 24, 35, 48, 57, 71, 82, 95, 106, 118, 130, 143
Notes on the reported extinction of the genus Achatinella and marvelous development of a Florida Fasciolaria. 123
Olivella, a new variety of (O. gracilis var. Gaylordi Ford). (Pl. II). 103
Orthalicus of Florida 37, 57
Patulastra? (Punctum?) pugetensis Dall, n. sp. . . 130
Perostylus, a new genus of Fusoid gastropod . . . 17
Perostylus Brazieri Tryon 17
Perostylus Fordianus Pilsbry 18
Perostylus the embryo of Megalatractus 67
Pisidia, two new (Pisidium cruciatum Sterki; P. punctatum Sterki). (Pl. II). 97, 99
Pisidia, on collecting 113
Planorbis alabamensis Pilsbry, n. sp. 114
Planorbis bicarinatus aroostookensis Pilsbry, n. var. . . 115

Plaxiphora Suteri Pilsbry, n. sp. 8
Pleurocera alveare Conrad, variations of 82
Polygyra hirsuta, variations due to station in . . . 24
Polygyra hirsuta on Long Island 75
Potamanax, note on 131
Pupa syngensis from Montana 35
Purpura saxicola Val. 12
Pyramidula? Randolphii Dall, n. sp. 130
Rafinesque, the life and writings of 119
Rangia the proper name of the Mactoid genus Gnathodon. 102
Remarks on the status of species and subspecies . 49
Shell hunt forty feet under the sea 85
Shells of Aroostook Co., Maine 125
Siphonaria sirius Pilsbry, n. sp. 8
Siphonaria acmaeoides Pilsbry, n. sp. 16
Siphonalia Stearnsii Pilsbry, n. sp. 31
Somatogyrus Sargenti Pilsbry, n. sp. . . . 102, 105
Some Arkansas snails 36
Southern shells in Missouri 18
Spirula peroni in Jamaica 36
Spisula Gray 40
Spisula subtruncata 28
Tasmanian Acmæa and Ischnochiton, note on . . . 127
Trachydermon (Cyanoplax) Raymondi Pilsbry, n. sp. . 46
Trachydermon (Cyanoplax) Raymondi in British Columbia. 27
Unio ellipsis in the Tennessee River 82
Unio oregonensis Lea, note on 116, 130
Unio ochraceus and cariosus. (Illustrated). . . 121, 143
Urosalpinx cinereus in San Francisco Bay . . . 13
Veronicella found in Central America, note on the species of 140
Veronicella sp. nov. vel. mexicana var. 142
Veronicella sp. nov. vel puntatissima var. 143
Vertigo morsei Sterki, n. sp. 89
Vivipara georgiana limnothauma Pilsbry, n. var. . . 116
Zonites cellarius in Western Pennsylvania . . . 82

INDEX TO CONTRIBUTORS.

Baker, Frank C. 57
Bradshaw, Mrs. M. F. 100, 112
Burns, Frank 57
Clapp, Geo. H. 24, 82, 116
Cockerell, T. D. A. 57, 92, 140
Dall, Wm. H. 5, 25, 35, 39, 73, 112, 126, 129
Ford, John 103, 123
Fulton, Hugh 125
Gardner, A. H. 75
Gill, Theo. 102
Hedley, Chas. 72, 85
Henderson, Jr., J. B. 1, 19, 31
Hinkley, A. A. 82
Hodgson, C. S. 82
Johnson, C. W. 74
Leach, Dr. M. L. 10
Lind, G. D. 106
Nylander, Olof A. 125
Pilsbry, H. A. 8, 16, 29, 37, 45, 47, 49, 53, 61, 81, 102, 114, 127
Prime, Henry 69
Sampson, F. A. 18, 36
Sargent, H. E. 96, 104
Schick, Morris 133
Simpson, Chas. T. 52, 91, 116, 121
Squyer, Homer 63
Stearns, Robt. E. C. 6, 13, 29
Sterki, Dr. V. 89, 97, 113
Taylor, Rev. Geo. W. 66
Wetherby, A. G. 14, 43
White, Frank A. 11
Willcox, Joseph 79
Winkley, Rev. Henry W. 78
Wood, Williard M. 33



DALL—West American Mactridæ.

THE NAUTILUS.

VOL. VIII. MAY, 1894. No. 1

LIST OF SHELLS COLLECTED IN JAMAICA.

BY J. B. HENDERSON, JR.

First paper: Glandinidæ, Zonitidæ, Helicidæ.

The following is a list of a collection made by Mr. Charles T. Simpson and myself in Jamaica, during the months of December and January (in part) last. We were upon the island about one month and although we devoted ourselves assiduously to hunting snails, yet so much time was spent in getting about from place to place, and otherwise lost, that our collecting appears, after all, to have been very superficial—a mere hasty gathering of what presented itself along the roadside.

I have attempted, as far as possible, to be "up to date" in the nomenclature. Mr. Simpson cheerfully assumed the heavy task of identifying the material, for which I am very much indebted to him. To Mr. Vendryes I wish to extend my thanks for courtesies shown us by him in Kingston.

1. Glandina nitidiuscula C. B. A. Bog Walk.
2. Glandina unicolor C. B. A. Montego Bay; Bog Walk.
3. Glandina propinqua C. B. A. W. of Ocho Rios; Mandeville; Spurtree Hill; Port Antonio.
4. Glandina perplexa C. B. A. Montego Bay; St. Anns; Stony Hill.
5. Glandina griffithi C. B. A. Bog Walk.
6. Glandina similis C. B. A. Gallina Point; Bog Walk; Port Antonio; Mt. Pleasant; Hope River; Ocho Rios; Mandeville.
7. Glandina ligata C. B. A. Mandeville.
8. Glandina venusta Pfr. Hope River.

9. Glandina nemorensis C. B. A. Hope Bay.

10. Glandina elegans C. B. A. (Bought).

11. Glandina philippiana Pfr. Bog Walk.

12. Glandina arcuata Pfr. Montego Bay.

13. Glandina costulata C. B. A. West of Port Antonio.

14. Glandina proxima C. B. A. Bog Walk.

15. Glandina gracilior C. B. A. Mandeville; Bog Walk.

16. Guppya epistylium C. B. A. Mandeville.

17. Zonites (Stenopus?) simulans C. B. A. West of Port Antonio. (This seems, from the characters of the shell, to be a Stenopus).

18. Sagda foremaniana C. B. A. Bought.

19. Sagda cookiana C. B. A. Bog Walk; Stony Hill; Mandeville.

20. Sagda spiculosa Shuttl. St. Anns Bay; Ocho Rios; Gallina Point; Bluefields; Buff Bay; Sav. la Mar.

21. Sagda connectens C. B. A Near Bluefields.

22. Sagda epistylium Müll. Mandeville; Montego Bay; Sav. la Mar.

23. Sagda alveare Pfr. Bog Walk; Stony Hill.

24. Sagda maxima n. s. Eight miles north of Sav. la Mar.

25. Sagda jayana C. B. A. Bog Walk.

26. Sagda alligans C. B. A. Near Sav. la Mar.

27. Sagda epistyloides Fér. Mandeville.

28. Sagda (Hyalosagda) osculans C. B. A. Montego Bay.

29. Sagda (Hyalosagda) osculans var. delaminata C. B. A. (?) Hope River.

30. Sagda (Hyalosagda) arboreoides C. B. A. Bog Walk; Buff Bay; Pt. Maria; Hope River; Stony Hill; Petersfield; Spurtree Hill; Mandeville; Pt. Morant; Bowden; St. Anns; Port Antonio.

31. Sagda (Hyalosagda) hollandi C. B. A. St. Anns; Port Antonio; Ocho Rios; Bowden; Buff Bay; Montego Bay; Mandeville; Gallina Point.

The Sagdas are very variable in size, form and development of internal laminæ, and appear often to blend one into another.

32. Thysanophora spreta C. B. A. Pt. Antonio. (Microphysa [preoccupied] =Thysanophora).

33. Thysanophora brevior C. B. A. Gallina Pt.; W. of Pt. Antonia.

34. Thysanophora apex C. B. A. Montego Bay.

35. Thysanophora fuscula C. B. A. Bog Walk.

36. Thysanophora diminuata C. B. A. Montego Bay; Mandeville; Long Mt.; Little River; Falmouth; Ramble (Hanover); Pt. Antonio; Bowden; Cave and ledge near St. Anns; Gallina Point; Pt. Antonio.

37. Thysanophora boothiana Pfr. Bluefields; Petersfield; Mandeville; Black River; St. Anns; Mt. Pleasant. (T. authoniana C. B. A. seems to be only a slightly larger and solider form of this).

38. Thysanophora sincera C. B. A. Port Antonio; St. Anns Bay; Ramble; Gallina Point; Montego Bay; W. of Pt. Antonio. (Seems only to be a less strongly ribbed var. of T. diminuata).

39. Thysanophora peraffinis C. B. A. Cave St. Anns; Duncan; Rio Novo; Petersfield; Buff Bay; Hope River; Pt. Antonio; Ramble; Bog Walk; Falmouth; Montego Bay; Bluefields; Bowden; Little River; Gallina Point; Ocho Rios; Spurtree Hill; Mt. Pleasant.

40. Thysanophora perdepressa C. B. A. Long Mt.; West of Pt. Antonio.

41. Thysanophora turbiniformis Pfr. Hope Bay; Gallina Point; Bog Walk; Bowden; Mandeville; Mt. Pleasant; Pt. Antonio; Duncans; Rio Novo; Spurtree Hill; Buff Bay; St. Anns; Ocho Rios; Falmouth. (Quite variable. The var. from Spurtree Hill much elevated. Those from Falmouth, Ocho Rios, St. Anns, and Rio Novo greatly depressed).

42. Thysanophora ptychodes Pfr. Mandeville; Bog Walk.

43. Thysanophora immunda C. B. A. Bluefields; Stony Hill; Bog Walk. (T. ptychodes, according to Adam's shells in the Natl. Museum, is considerably more depressed and sharper keeled than this species. All our material, however, of both forms is intermediate in form and it is probable that the two run together).

44. Zaphysema macmurrayi C. B. A. Mandeville; Petersfield (dead).

45. Zaphysema tunicata C. B. A. Bought.

46. Zaphysema tenerrima C. B. A. Bog Walk.

47. Zaphysema columellata C. B. A. Beach, Morant Bay; S. of Montego Bay. (*Zaphysema* is a generic name applied by Pilsbry to the Jamaican forms hitherto included in *Cysticopsis*).

48. Helix (Pleurodonte) bainbridgei Pfr. Bought. (*Lucerna* is now included in de Waldheim's *Pleurodonte*. See Man. Conch., (2), Vol. IX, p. 80).

49. Helix (Pleurodonte) lucerna Müll. St. Anns; Morant Bay; Yallaho R.

50. Helix (Pleurodonte) lucerna v. julia Fér. Cave, St. Anns.

51. Helix (Pleurodonte) lucerna v. fuscolabris C. B. A. Little River.

52. Helix (Pleurodonte) acuta Lam. (small var.). Mandeville; Bog Walk.

54. Helix (Pleurodonte) acuta v. nobilis C. B. A. Stony Hill.

54. Helix (Pleurodonte) acuta v. nannodonta Brown. Mt. Pleasant.

54a. Helix (Pleurodonte) acuta v. albino. Sav. la Mar.

55. Helix (Pleurodonte) acuta v. lamarcki Fér. Bluefields; Bog Walk.

56. Helix (Pleurodonte) peracutissima C. B. A. Mandeville (fine living spec.); Petersfield; Spurtree Hill (dead).

57. Helix (Pleurodonte) sloaneana Shuttl. Montego Bay. (*Helix vendryesiana* of Cockerell, specimens of which were sent to the Natl. Museum by the author from this localitiy, seems to be identical with this).

58. Helix (Pleurodonte) schroeteriana Pfr. Petersfield; Mt. Pleasant.

59. Helix (Pleurodonte) tridentina Fér. Sav. la Mar. (Seems to connect with last).

60. Helix (Pleurodonte) invalida C. B. A. Stony Hill.

61. Helix (Pleurodonte) bronni Pfr. St. Anns Bay.

62. Helix (Pleurodonte) sinuata Müll. Mandeville.

63. Helix (Pleurodonta) consanguinea C. B. A. Bog Walk.

64. Helix (Pleurodonte) sinuosa Fér. Bog Walk.

65. Helix (Pleurodonte) picturata C. B. A. Sav. la Mar.

66. Helix (Pleurodonte) anomala Pfr. Bought.

67. Helix (Thelidomus) aspera Fér. Mandeville; Rio Bueno; Spurtree Hill; Mt. Pleasant; Petersfield; Bog Walk; Montego Bay.

68. Helix (Eurycratera) jamaicensis Gmel. Cave St. Anns; Bluefields; Bog Walk; Mandeville.

69. Helix (Thelidomus) jamaicensis v. cornea Simpson. Mandeville. (A var. without any coloring whatever, and with a corneous epidermis).

70. Helix (Hemitrochus) graminicola C. B. A. Bog Walk; Spurtree Hill; Long Mt.; Stony Hill; Mandeville.

71. Helix (Dialeuca) conspersula Pfr. Sav. la Mar, on logwood trees.

The Dialeucas are very variable and puzzling and none of the specimens collected exactly agree with any figures or descriptions known to the writer.

72. Helix (Dialeuca) conspersula v. platystyla Pfr. Sav. la Mar (on trees).

73. Helix (Dialeuca) conspersula v. virginea C. B. A. Mt. Pleasant (on trees).

74. Helix (Dialeuca) subconica C. B. A. Mandeville; Stony Hill.

75. Helix (Dialeuca) fuscocincta C. B. A. Bought.

76. Helix (Dialeuca) nemoraloides. C. B A. (?) Bog Walk.

77. Helix (Dialeuca) blandiana C. B. A. Buff Bay; Pt. Antonio.

78. Helix (Dialeuca) gossei Pfr. Hope River. (Pilsbry and others unite this with *H. subconica* C. B. A. There is a shell of the above and specimens of Adam's species in the Natl. Museum which were labelled and sent by Adams to Dr. Lea. *H. conica* is a thin shell, much more depressed and with straighter spire than this species; the last whorl is scarcely descending anteriorly, while in this species it is abrupt and strongly deflected. In *H. gossei* the outer lip is thickened and reflected, the columella is quite strong and broad. If it were found in Cuba it would be called a Coryda, and is suggestive of an elevated *Helix alauda*).

(*To be concluded in June number.*)

ON SOME SPECIES OF MULINIA FROM THE PACIFIC COAST.

BY W. H. DALL.

Mulinia modesta, n. s. (Plate I, lower fig.).

Shell rather small, ovate-triangular, thick, equilateral, covered with a lineated straw colored thin epidermis, ivory white with a few rusty flecks toward the umbones; surface smooth except for incremental lines; anterior dorsal area obscure, posterior larger, bordered by a hardly angulated ridge on which the epidermis forms a raised line, but without any marginal flexure behind the basal termination of this ridge; anterior end evenly rounded, beaks prominent, pointed rather distant, pallial sinus well marked. Lon. 42.0 alt. 31.0, diam. 24.0 mm.

Habitat, Guaymas, Sloat, in U. S. Nat. Mus.

This differs in its proportions from *M. carinulata* Desh. to which Carpenter referred it. The latter is with little doubt merely a young specimen of *M. pallida* Sby. the *M. donaciformis* of Gray, better known as *angulata* Gray. It is a thinner shell with a sharp keel terminating in a somewhat recurved acute point, and having the beaks more anterior than *M. modesta*. The beaks are decidedly more distant in the latter.

Mulinia coloradoensis, n. s. (Plate I, upper fig.).

Shell larger, solid, rude, equilateral, resembling *M. modesta*, but having the posterior dorsal margin more arched, the base behind the posterior dorsal angle, somewhat concavely flexuous, and the surface anteriorly and on the dorsal area marked with obsolete, little elevated radii. Lon. of a medium sized specimen 49, alt. 36.5, diam. 32 mm.

Habitat, Head of the Gulf of California in the estuary of the Colorado River, abundant; Dr. E. Palmer.

M. coloradoensis var. **acuta**, n. s. (Plate I, left fig.).

Shell thinner, longer, and more flexuous posteriorly. Lon. 40, alt. 29 mm.

Habitat, with the typical form, common.

Mulinia Bradleyi, n. s. (Plate I, right fig.).

Shell resembling a miniature *M. donaciformis* but more compressed, shorter, the beaks smaller and less prominent, the posterior dorsal margin much more arched, no basal flexuosity, the pallial sinus longer and more rounded internally, and the epidermis elevated into narrow fringes, more or less regularly spaced. Lon. 32, alt. 26, diam. 15 mm.

Habitat, Panama; Bradley, in U. S. Nat. Museum.

TRIODOPSIS + MESODON.—DISTRIBUTION, ETC.

BY ROBERT E. C. STEARNS.

In the last number of the Manual (Pulmonata Series), Mr. Pilsbry very properly unites *Triodopsis* and *Mesodon;* both of these are Rafinesque's names; in order of date, the former has priority, therefore *Mesodon* must take a back seat. As to the propriety of these names, neither is satisfactory. *Triodopsis* the name that must stand for the reason above given, priority, conveys a false idea, for as Mr. Pilsbry says, in the remarks[1] that precede his list:

[1]Manual of Conchology, pt. 34, pp. 74–76.

"The species enumerated below have been divided by authors into two sections, *Triodopsis* and *Mesodon*, but such division seems to be artificial. Some species of *Triodopsis* are known to have varieties lacking lip teeth, and these would technically fall into *Mesodon*.

"In other cases, such as the group of Idaho and Washington species, all the transitions from tridentate to toothless apertures occur. The group of *P. appressa* is also a transition group. Tryon has resuscitated the section names *Xolotrema* and *Ulostoma*. The first of these is a Rafinesquian name totally unidentifiable; the second was proposed by Albers for species of *Polygyra ss.* and *Triodopsis ss.*, and did not include either of the forms Tryon uses the name for! *Aplodon* Raf. has also been used in this connection; it is positively unidentifiable." Whoever has had occasion to review the points referred to by Mr. Pilsbry, cannot fail to indorse his conclusions.

Triodopsis as a name is as unsatisfactory as *Mesodon;* but there it is, and it will have to stick. *Xolotrema* and *Ulostoma* must be consigned to the waste basket; fortunately they are book names rather than names in practical use.

Touching the matter of distribution in connection with the foregoing, the farthest outpost of *Triodopsis*+*Mesodon* in the Southwest is that occupied by *T. levettei* at Fort Huachuca and Tucson, Arizona, about on the line 32° N. latitude and 111° longitude W. While Santa Fè, New Mexico, where the type described by Bland was collected, is considerably further to the north and east. At the first named place the three genera, *Arionta*, *Patula* and *Triodopsis* occur in close geographical proximity, but there are wide gaps between these localities and the west coast, and between the same localities and the nearest eastern localities of *Triodopsis*+*Mesodon*. So the more northerly line of distribution of *Triodopsis*+*Mesodon* is interrupted or discontinuous as I have pointed out elsewhere,[2] along the line as we proceed eastward from the Pacific Coast through the states adjoining the southerly boundary line of the Dominion of Canada, i. e. Washington, northern Idaho and Montana (according to Binney); then comes the gap between western Montana and the eastward.

Within the States above named we find *Triodopsis*+*Mesodon*, *Patula* and *Arionta* in geographical proximity as in the southerly region previously named. We find the *Triodopsis*+*Mesodon*

[2]Proc. U. S. Nat. Mus., Vol. XVI, pp. 749—50.

characters shading into each other in both regions though perhaps less frequently in the Atlantic Appalachian region, so that they appear to be in no way related to geographical or environmental differences or influences. Size, elevation or depression, color, sculpture, etc., are exhibited as might be supposed, in many and various facies, but the denticulation of the marginal lip of the aperture, or the presence of a tubercular callus or tooth on the parietal wall, or a tuberculoid lump or thickening at the base of the pillar, all of these last characters are inconstant and variable and are often present or absent in examples that are found in the same colony, at many if not all places, within the territory inhabited by the species of *Triodopsis+Mesodon* group.

In *Triodopsis levettei* from Arizona and New Mexico, as well as in *T. devia+Mullani* from the northerly region before indicated, "we find all the transitions from tridentate to toothless apertures occur." A comparison between 40 and 50 examples from Cœur d'Alene, Idaho, in addition to those previously contained in the National collection, indicate that *Mullani* is but a variety of *devia* as Mr. Binney has placed it[3]; and to quote Mr. Binney's remarks: "The variations of this species show very markedly the unsatisfactory character of our so-called genera. Here we have the typical *devia* as a *Mesodon*, though the variety is a true *Triodopsis*."

DESCRIPTIVE NOTICES OF NEW CHITONS—IV.

BY H. A. PILSBRY.

Plaxiphora Suteri, n. sp.

Shell resembling *P. biramosa* Q. and *P. superba* Cpr.; but girdle all over sparcely hairy, *without the least indication of pores or sutural bristles.* Valves smooth, with slight growth-wrinkles, the diagonal rib but slightly indicated. Ridge with a chestnut band with a stripe of green on each side of it, the pleura and lateral areas uniform blackish olive. Girdle blackish with chestnut hairs. Interior blue, fading to white on the sutural-plates. Length about 45, breadth about 25 mm.; (specimens all curled and contracted).

Timaru, Sumner and Port Lyttelton, S. Island, N. Z.; (H. Suter).

A young specimen has the earlier formed portion of each valve light brown, spotted with white. This is probably the normal coloring of the young shells.

[3]Manual Am. Land Shells, p. 119.

Ischnochiton elizabethensis, n. sp.

Shell small, elliptical-oblong, elevated at an angle of about 105°; carinated, the side-slopes somewhat convex. Color whitish or buffish-olive, finely and closely mottled all over with light olive-green, or having angular patches of olive at the sides of each valve; sometimes with black-green triangles on the ridge of some valves (valves ii, iv, vii, viii); the posterior margins of valves more or less tessellated light and dark. Girdle indistinctly tessellated with numerous small green bars or patches.

Intermediate valves not beaked. Valves finely granulated throughout, *the sculpture closely resembling that of Trachydermon cinereus* L. Lateral areas slightly raised. Posterior valve having the central mucro somewhat prominent, posterior slope concave.

Interior bluish, with a pair of darker green rays in each intermediate valve; the inflected posterior margin tessellated. Sutural plates small, separated by a very wide, straight, smooth sinus. Anterior valve having 10, intermediate valves 1–1, posterior valve 11 slits; teeth smooth and sharp; slit-rays showing as whitish lines; posterior tooth in intermediate valves short, removed from the posterior margin of valve by about its own length. Eaves narrow.

Girdle densely clothed with smooth, flattened imbricating scales.

Length 10½, breadth 7 mm.

Habitat: Port Elizabeth, S. Africa.

This little species closely resembles *Trachydermon cinereus* L. (*marginatus* auct.), or *dentiens* Gld., in sculpture and coloration, but differs from them in the totally diverse girdle-covering. I am indebted to Mr. G. B. Sowerby for specimens. It is the *Ch. marginatus* of his useful "Marine Shells of S. Africa," p. 50.

NOTICES OF NEW JAPANESE MOLLUSKS, II.

BY H. A. PILSBRY.

Siphonaria sirius n. sp.

Shell oblong, polygonal, low-conical with subcentral, erect, apex; *primary ribs all single, generally 7, strongly elevated and white;* interspaces wide, dark brown, radially finely ribbed. Interior brown-*black, the larger ribs indicated by white rays; Siphon occupying a single rib, never a double one.* Cavity with a white callus (rarely

chestnut colored), the region of the muscle-impression bordered with chestnut stains. Length 22, breadth 17–19, alt. 5 mm.

Sagami, and Kashiurazaki, Boshiu, Japan (Frederick Stearns!)

This species differs from *S. atra* Q. & G., *coreensis* A. & R., and their allies in having the siphonal rib single and simple. It is probably the species identified as *S. atra* by Dunker and other writers on Japanese shells. Several hundred specimens collected by Mr. Stearns agree in the characters above given. Not one shows any tendency to double the siphonal rib.

Helix (Euhadra) yaeyamensis n. sp.

Shell sinistral, perspectively umbilicated, depressed, thin but rather solid, light brown with a supra-peripheral brown line. Surface irregularly wrinkle-striate and in places showing an excessively fine, superficial spiral striation. Spire low conoidal, composed of 6 convex, slowly widening whorls, the last nearly twice as wide as the preceding, a trifle descending in front, rounded at the periphery and beneath. Aperture oblique, wide lunate; peristome flesh-tinted, narrowly expanded and subreflexed, and slightly thickened within, dilated at the columellar insertion. Alt. 17, greater diam. 27½, lesser 23 mm.

Yaeyama (Okinawa) Island, Loo Choo group. (Frederick Stearns).

This species is apparently most nearly allied to the Chinese *H. latilabris* Mlldff., but the umbilicus is more open, the lip narrower, aperture more oblique, etc. The umbilicus is wider and more open than in *H. quæsita.*

ISAAC LEA CHAPTER, AGASSIZ ASSOCIATION.

BY DR. M. L. LEACH, WEXFORD, MICH.

A vigorous chapter of the Agassiz Association has been in existence for several years and is known as the "Isaac Lea Conchological Chapter." Its members are scattered over this country from Maine to California, and some of them reside in Canada. The Chapter is divided into sections, each having a secretary, who has special knowledge of his department. A juvenile section has recently been added, and a goodly number of boys and girls are learning about shells. As the members are so widely separated, most of the com-

munications must be in writing. The most valuable papers consist of annual reports, which are sent to the members in turn, and are finally preserved by the general secretary. During the past years excellent work has been done by members of this Chapter, and an invitation is extended to working conchologists to apply to the secretary for membership.

The President of the Chapter is Prof. Josiah Keep, of Mills College, Cal., and the Secretary is Mrs. M. Burton Williamson, University P. O., Los Angeles Co., California.

MELONGENA CORONA Gmel.

BY FRANK A. WHITE, GEORGIANA, FLORIDA.

For many years I have seen these shells and have been sure that they were from a living mollusk, but until March 20, 1894 had never seen one alive.

On that day I went from Georgiana to Oceanus and as the river was very boisterous I went by way of the Thousand Islands. When about half a mile from my destination we all went ashore for a few minutes and there in the shoal, still water, were several pairs of *Melongena corona* apparently in the act of copulation. I very much desire to visit the station again when I have more time at my command and secure more of the shells and observe more closely their actions.

Structural and Systematic Conchology in the description says "operculum solid" but does not give material. It is horny and not very thick.

There is some variation in the living shells some having varices near anterior end of aperture, others smooth. Some time ago I found a broken shell much larger than any recent shell I have seen. The spire and part of the body whorl were gone but the aperture was intact and measured 3 inches in length including the callus of posterior canal. This seems to indicate that in "prehistoric times" these mollusks attained a much greater size than at the present time.

I neglected to say in the proper place that the living shells were in the Banana river in brackish water.

NOTES AND NEWS.

Mr. Edward W. Roper has returned from a two months trip to Jamaica. He reports a good time and considerable collecting.

Purpura saxicola Val.—A large suite of this species recently presented to the collection of the American Association of Conchologists by Mr. Williard M. Wood, shows an extraordinary amount of variation. Some very large examples are represented, the largest measuring 34 mm. alt. Others show variations from smooth to strongly corded. In color they vary from livid-white or gray; white to bright orange and to black, some being spirally banded with brown in the intervals between the white spiral riblets. The entire lot was collected in San Francisco County, Cal.

Mr. Frederick Stearns of Detroit, is in Philadelphia, working upon the literature of Japanese mollusks.

A. B. Kendig, D. D., has removed from East Orange, N. J., to 2190 Seventh Ave., New York City.

OBITUARY.

Mrs. D. L. Garlick expired suddenly March 16, 1894, in San Francisco. She was spending the winter in Alameda, as the guest of her sister, Mrs. Gaylord, 2116 Central Avenue, and the two ladies went out to the Cliff House and vicinity yesterday to spend the day collecting shells.

They climbed a precipitous height near Land's End station on the line of the Ferries and Cliff House Railroad, and when she reached a little station on the road, they sat down for a rest. Suddenly Mrs. Garlick fell forward and dropped on the floor. Upon trying to raise her up, Mrs. Gaylord was horrified to see that her sister was dead.

Weakness of the heart, aggravated by over exertion, is attributed as the cause of death.

The home of the deceased was at St. Paul, Minn., and she made it a practice for many years to spend the winters in California, either in Alameda or San Diego. She had been interested in the collection of shells for some years.

THE NAUTILUS.

VOL. VIII. JUNE, 1894. No. 2

UROSALPINX CINEREUS IN SAN FRANCISCO BAY.

ROBT. E. C. STEARNS.

The Report of the U. S. Commissioner of Fish and Fisheries 1889–91 just published (March, 1893), contains an interesting and valuable paper by Mr. Charles H. Townsend of the *Albatross* on "The Oyster Resources and Oyster Fishery of the Pacific Coast," etc., etc., in which he mentions the occurrence of *Urosalpinx cinereus* (=*Fusus cinereus* Say) on the beds of transplanted Eastern oysters near Belmont. It appears that this species, the "drill" of the oystermen, "has not become troublesome until very recently, and even now is abundant only in the southern part of the Bay.

* * * * * * * * *

"At the Belmont beds I had no difficulty in gathering a quart of these mollusks, in less than ten minutes, by merely turning over the large oysters when the water had receded from the beds.

* * * * * * * * *

"This destructive animal may have been introduced much earlier than the oyster-men suppose, as a few individuals accidentally imported among the original oysters would require several years to increase to the present numbers." They had not at the time of Mr. Townsend's investigation, been detected on the oyster beds at Millbrae, which are much nearer the sea.

This is the second form that has incidentally been introduced with the oysters from the Atlantic seaboard, *Mya arenaria* being the first; the latter has already become abundant, and therefore a val-

uable addition to the food supply of the West Coast. It seems strange that some of the conchologists or collectors should not have detected the *Urosalpinx* before; for while, no doubt it multiplies rapidly under favorable conditions, still the abundance of this form as shown by Mr. Townsend's investigation, indicates that it must have been on the Belmont beds for several years. The common *Purpura* of the coast, *P. crispata* has heretofore been found in considerable numbers on some of the oyster beds in San Francisco Bay. How it compares with the *drill*, as an oyster borer and pest to the oyster men, I have not learned.

We may reasonably look forward to the finding of a third eastern species, as an accidental or incidental transplantation; it may be already established there, in some of the beds of eastern oysters. I refer to the ribbed *Mytilus*, *M. hamatus* Say, which is so frequently met with here, attached to *Ostrea virginica*. Mr. Townsend or some of the local naturalists, should look after it—if not there *now*, it will be sooner or later.

Washington, D. C., March, 1894.

A FEW NOTES ON HELIX APPRESSA.

BY A. G. WETHERLY.

In the April NAUTILUS, Mr. Pilsbry has given us his description of *Triodopsis appressa*, and named a variety thereof, *perigrapta*. As I am at war in a good humored way, with the modern habit of designating the hundreds of varieties of our land shells by latin names, I hope to make my reasons plain in the following brief note. Referring to, but not copying Pilsbry's description of *perigrapta*, I will say that I have shells in my collection exhibiting every gradation of the sculpture in question, from a few "spiral incised lines" in specimens from Cherokee Co., N. C., to those in which these lines are not only crowded, but much more pronounced individually; and as these specimens are heavily ribbed, they aid in giving some parts of the surface of the shell a beaded appearance.

Every gradation may be traced in the specimens which I have, from the smooth albino form found at Cincinnati, Ohio, to those rough mountaineers from Morrowville, Tenn. Where then, does

perigrapta begin and where does it stop? Any of these varieties is just as much entitled to name as is the one selected for this honor. Among the rest is a large var., 23 mm., from Lookout Mt., Tenn. This variety is almost smooth or very sparingly costate. It is slightly wrinkled like *Z. inornatus*. But it is crowded with these incised lines *above* and *below!*

Another form that I collected at Gasper, Picking Co., Ga., in August, '83, is very costate, and has the incised lines very much crowded and developed. The Lookout shells have the parietal tooth long, curving, and joining the columellar callus in the umbilical region. The Gasper specimens have this tooth short and very erect. They also have the lip very much widened, and the spire elevated. I have, in my suite of this species, four shells, taken at random from a lot collected at Murphy, Cherokee Co., N. C., *in every one of which the upper tooth is well indicated*, the parietal tooth is short and erect, the spire elevated, the body whorl obtusely carinate and the whole surface above and below is crowded with "microscopic spiral incised lines." Now which is *perigrapta?* The deep costæ and the multitude of spiral incised lines roughen the epidermis of the Morrowville examples and begin to introduce the conditions attaining in *subpalliata*. These shells, in consequence, have a somewhat dull appearance, while the Lookout Mt. and Cherokee Co. specimens are highly polished.

A variety from Braden Mt., Tenn., is heavily costate, and has the spiral lines (as has every shell of *appressa*) but not "incised." These shells range from 12 mm. to 25 mm. (my largest specimen of *sargentiana*). This last form is costate, has the erect tooth, the carinate body whorl, and the spiral lines, not "incised," and is in fact nearer to the typical *appressa*, in every aspect, than the highly polished and shining specimens from N. C.

Now what is the philosophic method in treating such a problem? Is it to give all these varieties names, loading up our literature and check lists with trinominal designation for varieties that differ in the same County of the same State? Or shall we write our labels *appressa* var. with *locus* and so on to the end? There is at least one collection in the U. S. where the latter method prevails and will to the end. I am tempted, in this place, to prune and reset Mr. Pilsbry's phylogenic tree according to my ideas, but I will not take space for so doing now. I do not, however, believe that *dentifera* is the root or that the branches *sargentiana*, *appressa* and *perigrapta*

are of equal specific rank, or that two of them are of any specific rank whatever; and I base my statement not only upon the varieties of this species here briefly mentioned, but upon many others in my collection, from many States and mostly collected by myself.[1]

Why do we not take to our heart of hearts the great truth that there are no hard and fast lines in Nature's record either present or past, and hold close the splendid proof given by this shell?

The foreign student who has not seen all our shells can tell nothing by these names, but if he knows *appressa* he will have the truth suggested by *appressa*, etc. So, too, our catalogues will be something besides names and *nobis!* They will be expressive of facts in the life history of this humble race.

This is the method that appeals to me as the scientific, the truthful, the suggestive method; and I shall never cease to believe in it and to work for it.

NOTICES OF NEW JAPANESE MOLLUSKS, III.

BY H. A. PILSBRY.

Siphonaria acmæoides n. sp.

Shell oblong, nearly equilateral, but with excentric apex like *S. radiata* A. & R. (Zool. Samarang pl. 13, fig. 2). The even surface hardly modified by the 9–16 low, wide ribs, between which it is very finely radially striated. Siphonal rib wide but low and inconspicuous. Apex spiral, bent down and appressed. Interior blackish or chestnut within the muscle impression, outside of which it is radially striped black and white, the siphonal channel extremely shallow and inconspicuous. Color outside whitish-buff, speckled and maculated with brown, or whitish on the principal ribs, the intervals black-brown. Length 12¾, breadth 9½, alt. 3½ mm.

Prov. Boshiu, Japan (Frederick Stearns).

This little species very closely resembles *Acmæa Heroldi* in the general form and the coloration of the interior.

[1] Mr. Pilsbry intended *appressa*, not *dentifera* for the root, in his diagram. The "tree" is seen from above, not from the side.—Ed.

PEROSTYLUS, A NEW GENUS OF FUSOID GASTROPOD.

BY H. A. PILSBRY.

In volume IX of the Manual of Conchology, Mr. Tryon described and figured a shell from Port Darwin, N. Australia, as *Cerithium (Colina) Brazieri*. Having occasion recently to study a large number of *C. macrostoma* Hinds, the type of the subgenus *Colina*, I was at once struck by the notable difference between this species and *C. Brazieri*. The latter does not seem to belong to the *Cerithiidæ* at all, much less to the group *Colina*. I am more inclined to view it as an aberrant type of the *Fusidæ*, although only a knowledge of the operculum and dentition can decide the question. The new group may be thus diagnosed:

PEROSTYLUS n. g. *Gen. Char.:* Shell cylindrical or pillar-shaped, thin, with decollated apex like that of a *Rumina* or *Cylindrella;* last whorl but little wider than the spire; aperture small, shaped like that of *Fusus* or *Chrysodomus* (*Sipho*), produced in an open canal below; columella straight or sinuous, without folds; outer lip thin and fragile. Type *Cerithium (Colina) Brazieri* Tryon.

The decollation of the spire is not the result of erosion, as in the species of *Potamides* and *Melaniidæ*, nor is the apex filled with a thick solid mass of shell-tissue as in those groups. In *Perostylus* the structure is like that of *Rumina decollata* or the West Indian Cylindrellas.

The genus will consist for the present of two species.

P. Brazieri Tryon.

Shell cylindrical, white, fragile, hardly tapering, consisting of 6½ remaining whorls, each carinated and obtusely nodulous in the middle, and obsoletely spirally lirate. Last whorl with one or two spiral cords below the peripheral keel, and more distinctly spirally lirate, the base nearly smooth. Aperture one-third the length of the shell; outer lip thin and fragile, columellar lip distinctly sigmoid, smooth. Alt 21, diam. 6 mm.

Habitat, Port Darwin, N. Australia (John Brazier).

If this shell could be reproduced in the form it would have were the earlier whorls not decollated, it would be by all odds the most attenuated Gastropod known, surpassing even the Terebras in the number of its slowly increasing whorls. The numerous young shells

before me fully support this opinion. Unfortunately none of them are young enough to show the apex. The youngest of them, although not half the diameter of the adult, show the same almost imperceptible degree of tapering.

P. Fordianus Pilsbry.

Shell cylindrical, white, thin; spire hardly tapering, but last whorl notably wider. Remaining whorls 4½, sculptured as in the last species, but the next-to-the-last whorl is distinctly narrower than the preceding whorl. Aperture nearly one-half the length of the shell; outer lip thin, simple; columella straight, a trifle deflected toward the left below. Alt. 19, diam. 7½ mm.

Habitat unknown. The specimens were presented to the Academy by Mr. John Ford.

This species is distinguished from the preceding by its straight, not sigmoid columella, and by the fewer remaining whorls. As the last character might possibly be the result of greater age, I do not now attach much importance to it, although it will probably prove to be a constant specific feature.

SOUTHERN SHELLS IN MISSOURI.

BY F. A. SAMPSON, SEDALIA, MO.

In the March *Nautilus* there is a reference to *Helicina orbiculata* having been collected in Stone county, Missouri, "probably near its northern limits." I have it in my collection from three other counties in Missouri: Jasper, Barry, and Macdonald, all of them being near the southern line of the state.

Of some other southern species I have specimens from places further north, a list of which is here given:

Bulimulus dealbatus Say, from the counties of Macdonald, Barry, Douglas, Camden and Cooper, the two latter being in the central part of the state.

Polygyra triodontoides Bland, from Barry.

P. jacksoni Bland, from Jasper, Barry, Macdonald, Dade and Camden.

P. dorfeuilliana Lea, from Howell and Douglas.

P. sampsoni Weth., from Macdonald, Jasper, Barry, Camden and Benton the latter being in Central Missouri.

P. leporina Gld., from Barry, Butler and Cape Girardeau.

Stenotrema labrosum Bland, from Macdonald, Barry, Jasper, Dade and Greene.

Triodopsis vultuosa Gould, from Macdonald, Dade and Pettis, the latter being in Central Missouri.

Mesodon divestus Gould, from Barry, Jasper and Dade.

M. andrewsi W. G. B., from St. Francois.

LIST OF SHELLS COLLECTED IN JAMAICA.

BY J. B. HENDERSON, JR.

Second paper: Orthalicidæ, Cylindrellidæ, Pupidæ, Operculata.

78. Bulimulus immaculatus Rve. Long Mt.; S. of Pt. Maria.

79. Orthalicus undatus Brug. E. of Kingston, on trees. Hope River (dark var.).

80. Cylindrella montana C. B. A. Bought.

81. Cylindrella columna C. B. A. Bog Walk (?).

82. Cylindrella striata Chitty (?). St. Anns.

83. Cylindrella ovata Desh. (?). St. Anns.

84. Cylindrella cylindra Chem. Stony Hill.

85. Cylindrella sanguinea Pfr. Bog Walk.

86. Cylindrella brevis Pfr. Long Mt.; Ocho Rios; Hope River Rockfort.

87. Cylindrella brevis v. intermedia C. B. A. Hope River.

88. Cylindrella obesa C. B. A. Falmouth.

89. Cylindrella columna C. B. A. Rockfort.

90. Cylindrella gravesi C. B. A. Montego Bay; Little River; Bluefields.

91. Cylindrella bacquieana Chitty (?). Cave, Pt. Antonio.

92. Cylindrella nobilior C. B. A. Bog Walk.

93. Cylindrella aspera C. B. A. Yallahs River.

94. Cylindrella rosea Pfr. Mandeville.

95. Cylindrella rosea v. fortis C. B. A. Spurtree Hill.

96. Cylindrella rubra C. B. A. Bog Walk.

97. Cylindrella tenella C. B. A. Falmouth; Little River; Ocho Rios; Bog Walk; St. Anns; Gallina Point; Montego Bay.

98. Cylindrella alba C. B. A. N. of St. la Mar.

99. Cylindrella inornata C. B. A. Mandeville (dead).

100. Cylindrella seminuda C. B. A. Bog Walk; Long Mt.

101. Cylindrella robertsi C. B. Ad. Ocho Rios; Montego Bay; Stony Hill.

102. Cylindrella elongata Chem. Bog Walk; Stony Hill.

103. Cylindrella gracilis Wood. Mandeville.

104. Lia maugeri Wood. Bog Walk. Bought.

105. Macroceramus gossei Pfr. Spurtree Hill.

106. Pupa servilis Gould. Hope River; W. of Pt. Antonio.

107. Pupa tenuidens C. B. A. W. of Pt. Antonio.

108. Pupa jamaicensis C. B. A. Falmouth; Rockfort.

109. Pupa grevillea Chitty. W. of Pt. Antonio.

110. Pupa jardineana Chitty. W. of Pt. Antonio.

111. Pupa lata C. B. A. W. of Pt. Antonio.

112. Stenogyra (Opeas) pauperculus C. B. A. W. of Pt. Antonio; Mt. Pleasant.

113. Stenogyra (Opeas) terebella C. B. A. St. Anns; Long Mt.; Falmouth; Black River; Bog Walk; Gallina Point; Montego Bay.

114. Stenogyra (Opeas) striosa C. B. A. Rockfort; Montego Bay; Black River; Bog Walk; Duncans; Pt. Antonio; Mt. Pleasant; Bowden; Bluefields; Long Mt.; Ocho Rios; St Anns; Gallina Point; Hope River.

115. Stenogyra (Subulina) octona Chem. St. Anns; Pt. Maria; Pt. Antonio; Kingston; Hope Bay; Gallina Point; Buff Bay; Bowden; Mandevllle; Mt. Pleasant; Bluefields; Remble; Petersfield; Bog Walk; Stony Hill; Long Mt.; Annotha Bay; Ocho Rios.

116. Stenogyra (Subulina) octonoides Chem. Pt. Antonio; Bog Walk; Black River; Mandeville; Gallina Point; Montego Bay.

117. Stenogyra (Spiraxis) solitaria C. B. A. Long Mt.; Montego Bay.

118. Stenogyra (Spiraxis) pellucens C. B. A. Bog Walk; Ocho Rios; Rio Novo; Hope River; Annotha Bay.

119. Stenogyra (Spiraxis) aberrans Pfr. Cave, St. Anns.

120. Stenogyra (Spiraxis) subula Pfr. Spurtree Hill; Mandeville; Bog Walk; Stony Hill.

121. Stenogyra (Leptinaria) pallida C. B. A. Bog Walk; Montego Bay; Pt. Antonio; Mandeville; Ocho Rios.

122. Geostilbia iota C. B. A. W. of Pt. Antonio.

123. Succinea sagra d'Orb. Montego Bay; Pt. Antonio; Bog Walk; Bowden; Rio Novo; Buff Bay; Gallina Point; Pt. Maria; Petersfield; Mandeville; Bluefields.

124. Succinea contorta C. B. A. Bowden; Bluefields.

125. Succinea angustior C. B A. Montego Bay; St. Anns; Petersfield.

126. Succinea latior C. B. A. Pt. Antonio; Montego Bay; Mt. Pleasant; Gallina Point; Bowden; Mandeville; Rio Novo; Pt. Maria; St. Anns; Bog Walk; Black River.

(I believe all these Succineas to be one species).

127. Veronicella occidentalis Gldg. Pt. Antonio.

128. Veronicella sloanei Cuvier. Mandeville.

129. Carychium exilis C. B. A. Petersfield; St. Anns; Pt. Antonio.

130. Geomelania beardsleyana C. B. A. Bog Walk.

131. Geomelania minor C. B. A. Mandeville.

132. Geomelania fortis C. B. A. Mandeville.

133. Geomelania procera C. B. A. Pt. Antonio; Bowden.

134. Geomelania jamaicensis Pfr. Petersfield.

135. Geomelania pygmaea C. B. A. Rio Novo.

136. Geomelania vicina C. B. A. Black River.

137. Geomelania pauperata C. B. A. Montego Bay.

138. Geomelania affinis C. B. A. (?). Kingston.

139. Truncatella pulchella Pfr. Rockfort.

(In fresh water pool with Planorbis decipiens! This pool is by the roadside, the water slowly oozing out of a cut in the hill. A few above and a short distance from Kingston Harbor).

140. Truncatella scalerina Mich. Little River, on stones at low tide.

141. Truncatella succinea C. B. A. St. Anns; Petersfield, on mountain with hermit crabs, 9 miles from the sea; Ocho Rios.

142. Neocyclotus dubiosum C. B. A. Montego Bay; Falmouth.

("Neocyclotus" has been applied by Crosse and Fischer to the American forms of Cyclotus. The group of species with corrugated shells peculiar to Jamaica is placed by them in the subgenus Platystoma).

143. Neocyclotus (Platystoma) portlandiensis Chitty. Pt. Antonio.

144. Neocyclotus (Platystoma) semi-nudus C. B. A. Bog Walk.

145. Neocyclotus (Platystoma) varians C. B. A. Mandeville; Petersfield.

146. Neocyclotus (Platystoma) varians v. "a" Chitty. Bog Walk.

147. Neocyclotus (Platystoma) jamaicensis Chem. Petersfield; Mt. Pleasant; Mandeville; Bog Walk.

148. Neocyclotus (Platystoma) subrugosus Sby. Mandeville; St. Anns: Hope River; Sat. la Mar.

149. Neocyclotus (Platystoma) rupis-fontis Chitty. Mandeville.

150. Neocyclotus (lPatystoma) corrugatus Pfr. Mandeville; Spurtree Hill.

151. Neocyclotus (Platystoma) crassus C. B. A. Black River; Mandeville; Montego Bay: Sat. la Mar; Mt. Pleasant.

152. Neocyclotus (Platystoma) pretiosus Chitty. Bog Walk; Rio Novo.

153. Neocyclotus (Platystoma) ruber Chitty. St. Anns Bay.

154. Neocyclotus (Platystoma) jugosus C. B. A. Sat. la Mar.

155. Neocyclotus (Platystoma) jugosus v. rufilabris C. B. A. Bought.

156. Neocyclotus (Platystoma) corrugatissimus Chitty. Ocho Rios.

157. Neocyclotus (Platystoma) biswichi Chitty. Bluefields.

153. Neocyclotus (Platystoma) corrugatior Chitty. Gallina Pt.; Duncans.

159. Neocyclotus (Platystoma) gemma Chitty. Petersfield; Montego Bay.

160. Neocyclotus (Platystoma) granulatus Chitty (MS). Gallina Point.

161. Neocyclotus (Platystoma) nova-spei Chitty. Rio Novo.

162. Neocyclotus (Platystoma) zig-zag Chitty. Montego Bay.

163. Neocyclotus (Platystoma) annotatior Chitty. Gallina Pt.

164. Neocyclotus (Platystoma) sp. Bluefields.

(There is a remarkable rssemblance between the shells of this group, but a great diversity in the sculpture of the opercula which furnishes good specific characters).

165. Choanopoma fimbriatulum Sby. Mandeville.

166. Choanopoma lencina L. Bog Walk.

167. Choanopoma interruptum Lam. Mona House, Long Mt.

168. Adamsiella variabilis C. B. A. Bluefields.

169. Adamsiella mirabilis Wood. Montego Bay.

170. Adamsiella pulchra C. B. A. Gallina Point; Rio Novo.

171. Adamsiella grayana Pfr. Stony Hill; Bog Walk.

172. Adamsiella grayana v. aureo-labris Simpson. Rio Novo.

(These differ from the type in being less elevated, smoother and somewhat shining, in having a larger umbilicus; and in the aperture, which has the inner lip slightly or often not at all developed, and the outer smooth and reflexed, the whole a bright reddish orange. The outer lip of the type is little reflexed and generally lamellar, the border is usually straight at its upper part; in the var. it is invariably bent back. Were this not such a variable species, Mr. Simpson thinks it should receive a specific name).

173. Tudora columna Wood. Bog Walk.

=quinquefasciatum C. B. A.

174. Tudora armata C. B. A. Rochfort.

175. Tudora fecunda C. B. A. Hope River; Long Mt.; Stony Hill.

176. Tudora proxima C. B. A. Bog Walk; Mandeville; Pt. Maria.

177. Tudora angustae C. B A. Bowden; Hope River; St. Anns; Ocho Rios.

178. Tudora angustae v. rufilabre C. B. A. Near Ocho Rios.

179. Tudora fascia Wood. Gallina Point; Buff Bay; Pt. Antonio; Hope Bay; Little River.

180. Tudora crenulosum C. B. A. Spurtree Hill; Bluefields.

181. Tudora aurora C. B. A. Gallina Point; St. Anns.

=maritima?

182. Tudora maritima C. B. A. Rio Novo; Ocho Rios; Cave, St. Anns.

183. Tudora adamsi Pfr. St. Anns; Gallina Point; Falmouth, near Long Bay.

184. Tudora vilkinsoni C. B. A, Bluefields.

185. Tudora shepardiana C. B. A. Mt. Pleasant.

186. Colobostylus jayanus C. B. A. Mandeville; Bog Walk.

187. Colobostylus jayanus var. Bought.

188. Colobostylus albus Lam. Gallina Point; Rio Novo; St. Anns; Buff Bay.

189. Colobostylus albus v. fuscus C. B. A. Rio Novo.

190. Colobostylus tectilabris C. B. A. Spurtree Hill; Mandeville.

191. Colobostylus redfieldianus C. B. A. Bog Walk; Bluefields; Kings; Mt. Pleasant; Montego Bay; Black River.

192. Colobostylus bauhsianus Sby. Mandeville.
=hyacinthimum C. B. A.

193. Colobostylus chevalieri C. B. A. Little River.

194. Colobostylus chevalieri v. albus C. B. A. Montego Bay.

195. Colobostylus chevalieri virgatus C. B. A. Little River.

196. Colobostylus lamellosus C. B. A. Near Little River.

197. Colobostylus bronni C. B. A. E. of St. Anns; Falmouth; Little River; Ocho Rios; on stone walls in the sunshine at Montego Bay.

(One specimen from Mt. Pleasant that differs slightly from the others, but hardly specifically).

198. Colobostylus yallahensis C. B. A. (?). Duncans (in Portland): E. of St. Anns.

(Agrees with Reeves figure in Conc. Icon., Vol. XIII, pl. 13, but hardly with Adams' description. If it is not this it must be a new species).

199. Helicina neritella Gray. Montego Bay; Bluefields; Mt. Pleasant; Petersfield; Pt. Maria; Annotta Bay; Mandeville; Pt. Antonio; Stony Hill; Buff Bay; Bog Walk; Sav. la Mar.

200. Helicina neritella var. (banded) (new?) Bog Walk.

201. Helicina jamaicensis Sby. Mandeville.

202. Helicina aurantia Gray. St. Anns; Montego Bay.

(*To be Continued.*)

NOTES AND NEWS.

VARIATIONS DUE TO STATION IN POLYGYRA (STENOTREMA) HIRSUTA Say.—Having read your "Descriptive Notes on Certain Forms of Polygyra" in the April "NAUTILUS," I take the liberty of sending you two forms of *P. hirsuta* Say that I have found in this County. The first measures 8 mm. in diameter, is very common on *low ground*, in some places being the most plentiful species of Helix found, while the second form, 6 mm. diam., I have only found on *one high, and dry hill*, clear up at the top, among moss and stones, where the Trailing Arbutus (*Epigœa repens*) and Wintergreen grow. I think you will find No. 2 alive, as I only collected them last Sunday. Under the microscope you will see that while No. 1 has "sharp, rigid hairs" those of No. 2 are curved or hooked. It also seems to me that there is a noticeable difference in the "notch."—*Geo. H. Clapp, Pittsburgh, Pa., April* 3, 1894.

The Nautilus.

Vol. viii. JULY, 1894. No. 3

SYNOPSIS OF THE MACTRIDÆ OF NORTH AMERICA.

BY WM. H. DALL.

In revising the group of *Mactracea* with the intention of working up the Tertiary species of North America it became necessary to go over the whole of the recent species and enquire into their synonymy. The following lists of east and west American species seem likely to be useful to students, as the synonymy of the group has been in a confused state hitherto. The distinctions between the different types of *Mactridæ* have hitherto largely been lost sight of, owing to the practice of confounding all together under one or two generic names; and while, to those habituated to previous methods, the present arrangement may at first sight seem excessively subdivided, I have found, in going over the whole group of *Mactracea* in the National Collection, that features of geographical distribution and characters of importance in the development of the family in time, are brought out by it in a way which was wholly impossible by earlier methods. The present subdivision compared with that of most other groups of mollusks at the present time is not excessive, and by those who may be led to a close and accurate study of the mollusks in question hereafter I believe it will be found to be useful and convenient.

I. Synopsis of the Mactridæ of the Eastern coast of the United States.

Subfamily MACTRINÆ.

Genus **MACTRA** (L.) Lam., 1799.

(+ *Crassatella* [*cygnea*] Lam., 1799); Type *M. stultorum* L.

Mactra Richmondi Dall. Greytown, Nicaragua.

Subgenus MACTRELLA Gray, 1853.

(+*Papyrina* Mörch, 1853); Type:

Mactra (**Mactrella**) **alata** Spengler, 1802. Porto Rico to Brazil.

=*M. carinata* Lam., 1818; +*M. striatula* Auct. non L.

Subgenus MACTROTOMA Dall.

(=*Standella* Cpr. ex parte, non Gray; *Spissula* Mörch non Gray). Anterior left lateral tooth bidentate, right ventral tooth tridentate. Type:

Mactra (**Mactrotoma**) **fragilis** Gmelin, 1792. Hatteras to Rio Janeiro.

=*M. dealbata* Pult. 1803; +*M. brasiliana* Lam., 1818; +*M. oblonga* Say, 1822; +*M. ovalina* (Lam.?) Auct.; +*M. oblongata* Ravenel, 1834; +*M. bilineata* (C. B. Ads.) Reeve, 1854; +*M. silicula* Reeve non Desh. (?) 1854; +*M. ambigua* Weink. (?); +*M. anserina* Guppy, 1875. Not *Spisula fragilis* Gray, 1838.

Genus **SPISULA** Gray, 1838.

(=*Spissula* Phil., 1847, not Mörch, 1853; +*Spizula* Conr., 1868; +*Spisulina* Fischer, 1887). Type *Mactra solida* L., Gray, 1847.

Subgenus HEMIMACTRA Swainson, 1840.

Spisula (**Hemimactra**) **solidissima** Dillwyn., 1817. Labrador to Virginia.

=*M. gigantea* Lam., 1818; +*M. procera* Sol., mss.; +*M. Sayi* Gray, 1838.

S. (**Hemimactra**) **solidissima** var. **similis** Say, 1822. Rhode Id. to St. Thomas, W. Indies.

=*M. Raveneli* Conr., 1831; not *M. similis* Gray, 1828.

Section *Mactromeris* Conrad, 1868.

Spisula (**Hemimactra**) **polynyma** Stimpson, 1860. Hudson Bay to Cape Ann, Mass

=*M. ovalis* Gld., 1840, not J. Sowerby, 1817; +*M. ponderosa* Phil., 1844, not Eichw. nor Conr., 1830; +*M. grandis* Desh., 1830, not Gmel., 1788; +*M. similis* Gray, 1828, not Say, 1822; +*M. Grayana* Schrenck, 1867.

Genus **MULINIA** Gray, 1838.

Type *M. typica* Gray (=*M. edulis* King).

(=*Moulinea* Phil., 1853, - *Mulinea* Conr., 1867.)

Mulinia lateralis Say, 1822. New Brunswick to the West Indies.

=*Mactra subtruncata* Greene, 1833; not Da Costa, 1788.

Mulinia lateralis var. **corbuloides** Deshayes, 1854. Mostly southern.

=*Mactra rostrata* Phil., 1848, not Spengler, 1802.

Mulinia guadelupensis Recluz, 1852. West Indies.

=*Mactra cantrainei* Reeve, 1854; +*M. portoricensis* Shuttlew., 1856; —*M. donaciformis* Auct. non Gray; —*M. tumida* and *turgida* Guppy, non Gmelin.

Genus **GNATHODON** Gray, 1831.

Type *G. cuneatus* Gray, 1831.

(=*Rangia* Desm., 1832, - *Clathrodon* Conrad, 1833; +*Perissodon* Conrad, 1863; +*Columbia* Blainville, mss., 1834.)

Gnathodon cuneatus Gray, 1831. Gulf of Mexico.

=*Rangia cyrenoides* Desm., 1832.

Gnathodon cuneatus var. **nasutus** Dall, 1894. Texas.

Subgenus Rangianella Conrad, 1863.

Gnathodon flexuosus Conrad, 1839. Gulf of Mexico.

=*G. rostratus* Petit, 1853.

Gnathodon flexuosus var. **Petitianus** Dall, 1894. Mexico.

Genus **LABIOSA** (Schmidt) Möller, 1832.

Type *Mactra anatina* Spengler, 1802.

(=*Anatina* Schumacher, 1817, non Lamarck, 1809, —*Cypricia* Gray, 1840; +*Leucoparia* Mayer, 1867.)

Labiosa lineata Say, 1822. New Jersey to San Paulo, Brazil.

=*Mactra nuttallii* Reeve, 1854, non Conrad; —*M. recurva* Gray, 1828; +*M. papyracea* Auct. non Lamarck.

Subgenus Raeta Gray, 1853.

Type *L. canaliculata* Say, 1822.

(=*Cryptodon* H. & A. Adams, not of Turton or Conrad, - *Lovellia* Mayer, 1867.)

Labiosa (Raeta) canaliculata Say, 1822. New Jersey to southern Brazil.

=*Mactra campechensis* Gray, 1828.

Doubtful or spurious East American species.

Mactra nucleus Conr., 1831, from "New Jersey" is exotic, and stated by Tryon in the Am. Marine Conchology to be a native of Manila.

Mactrella (*Harvella*) *elegans* Sowerby, has been reported from "Florida" where it is unknown, and "Jamaica" probably by a misidentification. There is no specific difference between Panama and alleged Antillean specimens and the name cannot be admittəd to the East American list without further evidence.

Spisula subtruncata Da Costa. What appears to be a somewhat deformed subfossil valve of this species was sent from Lawlor's Lake, New Brunswick, to Dr. Stimpson by Matthews, many years ago. It is in the National Collection but no other specimen seems to have been collected on this side of the Atlantic and it is probably a ballast shell.

Spisula solidissima var. *Acadica* Matthews; Can. Nat. viii, no. 2, p. 111, 1877, from the higher clays beds at St. Johns, N. B. See also Ann. Soc. Mal. de Belgique ix, 1874. This may be founded on the specimen of *S. subtruncata* above mentioned, though Mr. Matthews' paper is not sufficiently explicit to determine. It is probably an exotic as he suggests.

Spisula "subimbricata Mont." Cockerell, in list of Jamaica shells, Nautilus, vii, p. 115, 1894. Montagu described no *Mactra* of this name. What the shell intended may be, is of course impossible to say, but possibly the following:

Mactra Richmondi n. s. Shell thin, small, white, inequilateral, with the posterior end shorter and its dorsal aspect obtusely keeled; surface nearly smooth, except the dorsal areas, which have short deep concentric grooves; beaks moderate, adjacent; lateral teeth rather short and small, smooth; pallial sinus small, rounded, extending forward to the vertical of the beaks; posterior end obtusely pointed. Longitude 21; alt. 14; semidiameter 4.5 mm.

One valve on the beach at Greytown, Nicaragua; Chas. Richmond. It is the only American species belonging to typical *Mactra* with grooved dorsal areas.

Mactra Cumingiana "Bush," Zool. Rec., 1885, from Cape Hatteras, is a *lapsus* of the Recorder for *Mactra Cumingiana*.

HELIX (ARIONTA) COLORADOENSIS:—A NEW LOCALITY.

ROBT. E. C. STEARNS.

This form first detected by Dr. C. H. Merriam[1] in the Grand Cañon of the Colorado, opposite the Kabab plateau, at an elevation of 3500 feet, in 1890, and subsequently near Resting Springs[2] in the southeastern part of Inyo County, California, at an elevation of 900 feet above the Springs, in February, 1891 by Mr. Vernon Bailey has recently (March of the present year) been obtained by Mr. C. R. Orcutt of San Diego, at Mountain Springs, Colorado desert, San Diego County. Mr. Bailey found his specimens among rocks on a dry hill: Orcutt found but one example a bleached shell with the band barely discernable. With these three points in mind it will be seen, that a wide range of distribution is already indicated for this species.

NOTICES OF NEW JAPANESE MOLLUSKS, IV.

BY H. A. PILSBRY.

Macroschisma Lischkei n. sp.

Nemoto, Boshiu (Stearns).

Shell oblong, *the length less than twice the breadth*; lateral margins convex, anterior margin well rounded, posterior margin bluntly rounded, subtruncate. Anterior slope straight, *decidedly less than half the length of the shell;* side slopes straight.

Surface sculptured with fine radial striæ, alternately larger and smaller, finer on the forward half of the side slopes; slightly decussated by growth lines. Color either (1) uniform black, or (2) closely speckled with black on a buff ground, or (3) crimson with or without dusky rays. *Posterior slope long* for the genus, about one-fifth the length of the entire shell; flattened or subconcave behind the hole, but not guttered. Perforation large, oblong, slightly narrower in front, and wider behind, with *a very narrow*

[1] Described by me in the Proc. U. S. National Museum, Vol. XIII, 1890.

[2] Mollusks of the Death Valley Expedition, U. S. Dept. Agriculture, (N. A. Fauna, No. 7), 1893.

eroded tract behind it. *Length of hole contained two and one-half, times in length of shell.* Interior bluish-white, the hole callus darker at the sides. When resting upon a plane surface, the peristome of the shell is seen to be *very much elevated behind, and but little less so in front;* the latero-basal margins strongly curved throughout.

Length 17⅔, breadth 9, alt. 5 mm.

Length 16, breadth 9¼, alt. 5 mm.

Twenty-two specimens collected. This seems a very distinct species; the position and proportions of hole, the long posterior and short anterior slope, and the strongly curved basal margins being especially characteristic, and unlike other described forms.

Cyrena luchuana n. sp.

Shell large, inequilateral, oblong, the anterior end short, broadly rounded, posterior end long, produced, and squarely truncated; basal margin gently arcuate, dorsal margin narrowly rounded at the beaks, the anterior slope short and nearly straight, posterior slope long, rectilinear. Valves strong, convex, the posterior dorsal area flat or concave, bounded by a blunt angle, another obtuse angle extending from beaks to lower posterior extremity. Interior white, stained with buff-olive on the hinge. Cardinal teeth bifid; anterior lateral very short and strong; posterior lateral long, remote from cardinals. Cuticle dull brown, with a yellow under color, irregularly wrinkle-striate, lamellose behind, and less so over the whole disk. Length 94, breadth 72, diam. 47 mm.

Yaeyama Island, Loo Choo group (Fr. Stearns).

Cyrena (papua var.?) yaeyamensis.

Shell shorter than the preceding, being less produced posteriorly, the posterior surface not so distinctly angular, posterior truncation less marked; anterior lateral tooth not so short. Anterior dorsal slope of hinge line straight, posterior dorsal slope slightly convex. Color and sculpture as in *luchuana*, except that there is usually some oblique corrugation of the posterior slope. Length 75, breadth 63, diam. 36 mm.

Yaeyama I., Loo Choo group (Frederick Stearns).

This may prove to be a form of *Cyrena papua*, or of *C. buschii* Phil. of China, but it is more triangular, with the posterior margin more produced.

Cyrena fissidens n. sp.

Shell resembling *C. sinuosa* as figured by Clessin (Conch. Cab., pl. 45, f. 1), but the posterior lateral tooth and corresponding pit

much slenderer and somewhat longer, the posterior cardinal tooth in right valve split by a sulcus much broader than the space between the posterior and the next adjacent cardinal tooth. Valves orbicular, very convex, lightly wrinkle-striate, and covered with a black cuticle. Posterior slope depressed, with a radiating wide and shallow furrow, rendering the margin slightly emarginate. Dorsal, anterior and basal margins well rounded; posterior margin obliquely subtruncate. Length 86, breadth 77, diam. 49 mm.

Yaeyama I., Loo Choo group. A single specimen (Frederick Stearns).

Siphonalia Stearnsii n. sp.

Shell fusiform, solid, brownish; spire conical, shorter than the aperture, consisting of 8 convex whorls, which are finely spirally lirate, and *closely* and strongly plicate; plicæ becoming partly or wholly obsolete on the body-whorl, which is very indistinctly or not at all shouldered, and runs upward somewhat toward the aperture, causing a narrow, small posterior channel. Aperture shaped as in *S. fuscolineata* Pse. but wider, the inner lip smooth, its edge raised and free; outer lip with a wide yellow internal border, inside of which it is thick, lirate and white. Anterior canal strongly recurved, short. Alt. 46, diam. 25 mm. Oblique alt. of aperture 29 mm.

Allied to *S. longirostris* Dkr., but less elongated, with more strongly plicate spire and different aperture, I cannot see that any of A. Adams' unfigured species agree with the specimens before me. The spire is longer and more plicated than in *S. fusoides* Reeve, and the canal more recurved.

LIST OF SHELLS COLLECTED IN JAMAICA.

BY J. B. HENDERSON, JR.

Third Paper: Operculata, Aquatic Pulmonata.

203. Alcadia hollandi C. B. A. Duncans; W. of St. Anns.

204. Alcadia adamsiana Pfr. Mandeville.

205. Alcadia solitaria C. B. A. Black River; Bluefields; Mt. Pleasant; Bog Walk.

206. Alcadia depressa Gray. Bluefields; Ora Cabessa; Bog Walk.

207. Alcadia browni Gray. Montego Bay; Bog Walk.

208. Alcadia palliata C. B. A. Mandeville; Bog Walk; Sav. la Mar; Stony Hill; Ora Cabessa; Mt. Pleasant; Gallina Point.

209. Alcadia palliata v. labiosa C. B. A. Montego Bay.

210. Alcadia maxima C. B. A. Petersfield.

Alcadia, as typified in *Alcadia palliata* (with slit in the base of the aperture) gradually blends into *Helicina*.

211. Eutrochatella tankervillea Gray. Bought.

("*Trochatella*" being preoccupied, "*Eutrochatella*" of Fischer is taken).

212. Eutrochatella pulchella Gray. Bog Walk; Ora Cabessa; Mandeville; Gallina Point; Stony Hill; St. Anns; Pt. Antonio; Montego Bay; Ocho Rios.

213. Eutrochatella costata Sby. St. Anns; Falmouth; Gallina Point; Little River; Rio Bueno.

214. Lucidella nana Pfr.

=Helicina lineata Ads. Mona House; Mandeville; St. Anns; Petersfield; Pt. Antonio; Bog Walk.

215. Lucidella inaequalis Pfr. Black River; Mt. Pleasant.

(Probably only a var. of *L. aureola*).

216. Lucidella aureola Fér. Everywhere.

217. Lucidella aureola v. granulosa C. B. A. Mandeville.

218. Lucidella aureola v. interrupta Simpson. St. Anns; Duncans.

219. Stoastoma jayanum C. B. A. Pt. Antonio; Petersfield; St. Anns; Bog Walk.

220. Stoastoma gouldianum C. B. A. Buff Bay.

221. Stoastoma pisum C. B. A. Mandeville.

222. Stoastoma sp. Mandeville.

223. Stoastoma sp. Petersfield.

224. Proserpina bidentata C. B. A. Mt. Pleasant.

225. Proserpina nitida Sby. Mandeville; Petersfield.

226. Proserpina discoidea C. B. A. Bluefields; Petersfield; Mt. Pleasant; Black River; Kings.

227. Proserpina opalina C. B. A. Montego Bay; Ocho Rios; Mandeville; Bog Walk.

228. Proserpina pulchra C. B. A. Mt. Pleasant; Bluefields; Bh. River; Kings.

229. Amnicola (?) rivularis C. B. A. Sweet River.

230. Amnicola jamaicensis C. B. A. Rockfort.

231. Potamopyrgus candeana Orb. Sweet River.
232. Neritina jamaicensis C. B. A. Great River.
var. of N. tristis Orb.?
233. Neritina punctulata Lam. Buff Bay.
234. Neritina tristis Orb. Sweet River.
235. Neritina tenebricosa C. B. A. Buff Bay; Sweet River.
236. Limnea umbilicata C. B. A. Bluefields; Sweet River.
237. Physa jamaicensis C. B. A. Ramble; Sweet River.
238. Planorbis affinis C. B. A, Kingston.
239. Planorbis dentiferus C. B. A.
239a. Planorbis dentiferus var. edentata C. B. A. Bluefields; Black River; Sweet River.
240. Planorbis redfieldi C. B. A. Bluefields.
241. Planorbis decipiens C. B. A. Bluefields.
242. Planorbis pallidus C. B. A. Rockfort.
243. Ampullaria fasciata Lam. Savannah la Mar.
244. Hemisinus lineolatus Wood. Sweet River; Great River; Rio Cobre; Mt. Pleasant; Sav. la Mar; Roaring River.
245. Melampus flavus Gmel. Little River.
246. Melampus caffeus L. Little River.
247. Melampus (Tralia) pusilla Gmel. Little River.
248. Pedipes naticoides Stearns. Little River.
=ovalis C. B. A.

MY DAILY WALK.

WILLIARD M. WOOD.

What student of conchology does not take a daily walk, whether it be to one's business house, a stroll after luncheon or a walk home. And while thus taking the outdoor exercise, does one "keep an eye open" for specimens? If not, do you imagine how many specimens are passed by?

My exercise consists of a daily walk of sixty blocks; thirty of which, I walk to my office, starting at 8.30 o'clock in the morning, and the balance, coming home at 5 o'clock in the afternoon.

Every day I carry with me, a small tin box, one which I can very conveniently carry in my pocket, in which my "finds" are contained; and when a morning is very damp, the result of a rain the day before, or when a heavy fog settles over the city, then I take with me a much larger box, inasmuch as I find that I can collect two or three times the amount of specimens that I would when the ground is not very moist.

Some mornings I gather great quantities of *Zonites lucidus* Drap. (sent to Mr. Pilsbry to be identified) while other mornings, *Agriolimax agrestis* Linn. may be found very numerous. However, the following list may be called a fair sample of the specimens I collect, while on my daily walk.

Specimens gathered on Nov. 11, 1893.	*No. collected.*
Helix (*Lysinoe*) *nickliniana* Lea var. *reticulata* Pfr.	48
Zonites cellarius Mull.	3
Zonites lucidus Drap.	32
Ariolimax columbianus Gld.	5
Amalia hewstoni Cooper	13
Agriolimax agrestis Linn.	27
Limax maximus Linn.	30
Prophysaon andersoni Cooper	21
Total	179

I may add, that of the above species, although *Limax maximus* Linn., has only been an inhabitant of this country for a period of about two years, it has multiplied so greatly, that it has become a nuisance to people who have flower gardens.

The slugs I find, generally crawl across the cement sidewalks and walls surrounding residences, while the *Zonites* apparently delight in crawling over the wooden door steps, and the *Helix reticulata* prefer secluded spots in vacant lots, among the grass or under boards. Of the last named species, I have at present, almost a thousand specimens and of the *Zonites lucidus* Drap. over three hundred specimens.

Is it not worth while then, to be "on the lookout" for specimens when out walking? One can thus see how I profit by my daily walk.

San Francisco, Cal., March 31, 1894.

NOTES AND NEWS.

Reversal of Cleavage in Physa.—Mr. Henry E. Crampton, Jr., has recently studied the early stages of *Physa* and *Limnæa*. In the former the cleavage is according to the typically spiral type, but *totally reversed* in direction. It will be interesting to learn whether this is directly correllated with the sinistral form of the adult.

On the 28th of January last, A. Th. von Middendorff, the celebrated traveller and zoologist died at his home near Dorpat. Middendorff is especially known to American conchologists as a writer on shells of the northwest coast.

Bulimus oblongus has recently been found by Mr. H. G. Hubbard, of the U. S. Agricultural Department, flourishing in St. Kitts, where it has been introduced from Antigua by a resident conchologist. This is perhaps, worth making a note of, since it has not been found so far north, and some one hereafter may suppose it native. Mr. Hubbard finds that a species of *Tillandsia* holds large quantities of water in the axils of the leaves; a good sized one he says will hold a barrel of water, and this water in the mountainous forests of Montserrat has a fauna of its own. He brought an *Amphibulima* (possibly *A. patula*) and *Pellicula* (*? depressa*) which he found in these moist retreats.—W. H. Dall, *in letter.*

Pupa syngenes Pils., has recently been received by the National Museum from Beaver Creek, Montana, (a tributary of the Little Missouri) in the river drift. This is a new locality, I believe, and interesting on account of its distance from the original place (Arizona).—W. H. Dall.

Note on Liparus.—When studying the apices of the Australian land shells *Panda* and *Caryodes*, the writer had occasion to examine those of the Australian Bulimuli belonging to the subgenus *Liparus* of Albers. In this group the earlier whorls are very closely *pitted*, somewhat like a thimble, while in *Panda* they are decussated, and in *Caryodes* spirally lirulate. The characters of the earlier whorls seem to be of much greater importance than has generally been supposed. *Placostylus* agrees with *Liparus* in the peculiar pitting. *Bul.* (*Leucotænius*) *favanii* has a closely costulate apex, like our *B. schiedeanus*. The name *Liparus* in mollusca is preoccupied by *Liparus* Olivier, Entomologie, ou Hist. Nat. des Insectes, Vol.

V, pp. 73, 283 (1807), for a genus of Rynchophorous Coleoptera. I therefore suggest as a new name for the Australian group BOTHRIEMBRYON, the type being *Bul. melo.*—PILSBRY.

SPIRULA PERONII in Jamaica.—Mr. Edw. W. Roper reports finding a specimen of this cephalopod containing the animal, during his recent visit to Jamaica.

MR. F. C. BAKER has been appointed Curator of the zoological department of the Field Columbian Museum at Chicago.

The collection of shells of the late DR. PHILIP P. CARPENTER is offered for sale. This is an excellent opportunity to obtain a valuable and authoritatively named collection. Address Mrs. Minna M. Carpenter, 241 University St., Montreal, Canada.

SOME ARKANSAS SNAILS.—On my trip here (Fort Smith, Ark.,) I did what I did some years ago—walked from Winslow, on the top of the Boston Mountains, to Porter, six miles this side. I collected quite a number of shells, and will send you some living *Triodopsis edentata, Stenotrema labrosum, Polygra Sampsoni* and *P. Jacksoni.* I got the *edentata* from the top of the mountain to Rudy, a vertical distance of 1500 feet. At the latter place they are found with the ordinary *Triodopsis inflecta.* I hope you will have time to examine the internal parts. I find that where I got the type specimens was in Washington County, instead of Crawford; but on this trip I gathered them in both counties.—F. A. SAMPSON, *in letter.*

THE MICHIGAN FISH COMMISSION has commenced an investigation of biological conditions of the Great Lakes, with especial reference to the life history of the white fish. The work will include a determination of the fauna and flora of Lake Michigan at Ann Arbor, and of their vertical and horizontal distribution. This determination will be both qualitative and quantitative, and will be particularly directed towards a study of the life history of the white fish and lake trout. Since the life of the water constitutes first or last the food of the fish in it, this determination will afford some idea of the value of this locality as a breeding ground for fish and of its adaptability as a planting ground for the fry. The party at work in the laboratory will consist of various specialists, Mr. Bryant Walker, Detroit, Mich., taking charge of the mollusca.

THE NAUTILUS.

VOL. VIII. AUGUST, 1894. No. 4

ON THE ORTHALICUS OF FLORIDA.

BY H. A. PILSBRY.

Thanks to the BINNEYS, father and son, we American malacologists rarely have anything but comparatively fair sailing when we have occasion to work with the land mollusks of our own Country. Only those who have spent days and months striving to unravel the tangled threads of synonymy, striving to see a little way into the mysteries of structure, of phylogeny or origin, and of geographic distribution, can rightly appreciate the debt we owe to two men who have given the best energy and scholarship of their lives to the study of American land shells.

Orthalicus melanocheilus var. Foridensis.

These reflections come to me as I think on the question of the number of species of *Orthalicus* found in Florida—a matter in which it seems to me that Mr. Binney's books have not been clear.

The species of this genus (or perhaps better, *subgenus*, for structurally it differs from *Liguus* only in trifling points) are not, for the most part, at

all well defined. The older authors mixed them sadly; and we moderns are in some danger of drawing over-fine distinctions Still, the systematic zoologist who makes any voyages at all, must perforce sail between Scylla and Charybdis. The great art is to steer a middle course.

Returning to our *Orthalicus*, we notice that the older collectors found only the zebra-striped forms in Florida, these being identical with the species so common in Jamaica, and known for many years under the names *zebra* Müller and *undatus* Bruguière.

Some authors have attempted to establish *undatus* and *zebra* as distinct species, but the last name was proposed for a medley of Achatinas and Orthalicus, not including the form now known as *undatus;* so it will be dropped from the lists entirely. The well-known Florida and West Indian species is O. UNDATUS Brug., (see W. G. Binney's works). It is not known from Mexico.

Besides this form, we find in a number of localities in Southwest Florida, an *Orthalicus* with nearly white shell, spiral brown bands and occasional oblique stripes, but none of the zig-zag flames so characteristic of *O. undatus.* This form was described by the writer in 1891, as follows:

Orthalicus melanocheilus Val. (1833).

One of the most distinct species of the genus, described originally from "New Spain" (*i. e.*, the Middle American mainland). The Florida specimens differ from the Mexican and Central American in a number of characters and seem to me perfectly distinct as a geographic variety.

O. melanocheilus var. **Floridensis** Pilsbry.

Shell white or slightly stained with brown, having no longitudinal zig-zag flames. The body whorl has three narrow brown bands, the upper one often broken into spots. There is a black varix on the penultimate whorl, and one or two on the body whorl. The varices are generally *not visible within the aperture, but the three spiral bands are conspicuous there.* Lip bordered with blackish-brown; columella white edged, but parietal callus deep brown.

The types of this variety are from near Cape Sable, Florida.

The synonymy of my variety includes:

Bulimus zebra W. G. Binney, Terr. Moll. U. S. Vol. IV, Pl. lxxviii, fig. 12.

O. zebra W. G. B. & T. Bld., Land and Fresh-water Shells of N. A., Vol. I, p. 216, figs. 370, 371.

O. undatus W. G. B., Manual of N. A. Land Shells, p. 440, fig. 483.

Von Martens has recently expressed the opinion that "Pilsbry's *O. melanocheilus var. floridensis* is probably a dark-mouthed variety of *O. undatus;*" but he had not seen a Florida specimen. The fact is that this is one of the most distinct forms of the typical group of *Orthalicus*, and if it be a variety of *undatus*, then *undatus* will cover *all* of the typical group of so-called species admitted by Crosse and Fischer, v. Martens, *et. al.*

II. SYNOPSIS OF THE MACTRIDÆ OF NORTHWEST AMERICA, SOUTH TO PANAMA.

BY WM. H. DALL.

Subfamily MACTRINÆ.

Genus **MACTRA** (Linné) Lam., 1799.

Subgenus MACTRODERMA Dall, 1894.

Shell as in *Mactra* but rude, inequilateral, with a coarse epidermis, pronounced pedal gape, the ligament set off from the cartilage but mostly sunken, concentrated dental armature, and the anterior arm of the right cardinal in the plane of the adjacent ventral lamina. Type:

Mactra (Mactroderma) velata Phil., 1848. Panama to the Gulf of California.

Subgenus MACTROTOMA Dall, 1894.

Section Mactrotoma ss.

Accessory lamellæ coalescent with laterals and cardinals.

Mactra (Mactrotoma) nasuta Gould, 1851. West Columbia to Lower California.

=*M. californica* Desh., 1854, not Conr., 1837; +*M. hiantina* Desh., 1854; +*M. ovalina* Auct. not Lam.; +*M. falcata* Weinkauff not Gould; +*M. fragilis* Cpr., 1858, not Gmel.; +*M. Deshayesii* Conr., 1868; +*Merope* sp. Weinkauff and *Spisula* sp. Conrad.

Section *Micromactra* Dall.

Hinge like the typical section, beaks sulcate, shell small.

Mactra (Mactrotoma) californica Conrad, 1837. Fuca Strait to Central America.

=*M. augusta* Desh., 1854; +*M. nasuta* Auct. not Gould; not *M. californica* Desh.

Section *Simomactra* Dall.

Accessory lamellæ free of the laterals.

Mactra (Mactrotoma) dolabriformis Conrad, 1837. San Diego, Cal., to Guaymas, Mexico.

Subgenus MACTRELLA Gray, 1853.

Section *Mactrella* ss.

Surface of the valves smooth.

Mactra (Mactrella) exoleta Gray, 1837. Gulf of Cal. to Guayaquil.

+*Lutraria ventricosa* Gould, 1851.

Section *Harvella* Gray, 1853.

Surface of the valves plicate.

Mactra (Mactrella) elegans Sby., 1825. Panama to Gulf of Cal.

+*M. pacifica* Conr., 1868.

Genus **SPISULA** Gray, 1837.

Type *M. solida* L. Gray, 1847.

Subgenus HEMIMACTRA Swainson, 1840.

Section *Mactromeris* Conrad, 1868.

Spisula (Hemimactra) polymyma Stm., 1860, var. **alaskana** Dall, 1894. Icy Cape to Necah Bay. (See eastern list for synonymy).

Spisula (Hemimactra) catilliformis Conr., 1867. Neeah Bay to San Diego.

+*Standella californica* Cpr., Auct., non Conr.

Spisula (Hemimactra) Hemphillii Dall, 1894. San Diego.

Spisula (Hemimactra) planulata Conrad, 1837. Monterey to San Diego. Not *planulata* of Cala. authors.

Subgenus *Symmorphomactra* Dall, 1894.

Teeth of *Mactrotoma*, ss.; hinge of *Spisula*.

Spisula (Symmorphomactra) falcata Gld., 1850. Comox, Br. Col. to San Pedro, Cala.

Genus **MULINIA** Gray, 1837.

Mulinia pallida Brod. & Sby., 1829. Panama to C. St. Lucas.

+*M. donaciformis* Gray, 1839, not of Reeve, 1854; +*M. angulata* (Gray) Reeve, 1854; +*M. carinulata* (Desh.) Reeve, 1854, (young shells); ?=*M. goniata* Desh., 1854, (unfigured and insufficiently described); +*M. bistrigata* Mörch, 1862.

Mulinia modesta Dall, 1894. Guaymas, Mexico.

+*M. carinulata* Cpr. non Deshayes.

Mulinia Gabbi Tryon, 1869. Lower California.

Mulinia coloradoensis Dall, 1894. Gulf of California, at Guaymas and thence to the Colorado-mouth.

Mulinia coloradoensis var. **acuta** Dall, 1894. Colorado river-mouth, Gulf of California.

Mulinia Bradleyi Dall, 1894. Panama, Bradley.

Genus **GNATHODON** Gray, 1831.

Subgenus RANGIANELLA Conrad, 1863.

Gnathodon (Rangianella) mendicus Gould, 1851. Estuaries, Gulf of Cal.

+*G. trigonus* Petit, 1853; +*G. truncatum* Petit, 1853.

Subfamily PTEROPSINÆ.

Genus **LABIOSA** (Schmidt) Moller, 1832.

Labiosa anatina Spengler, 1802. West Mexico.

+*L. pellucida* Schum., 1817; +*M. cyprinus* Gray, 1828; +*L. papyracea* (Lam.) Sby., 1824.

Subgenus *Raeta* Gray, 1853.

Labiosa (Raeta) undulata Gould, 1851. San Pedro, Cala., to Panama.

+*R. californica* Melvill, as of Sowerby.

Subfamily LUTRARIINÆ.

Genus **TRESUS** Gray, 1853.

+*Cryptodon* Conrad, 1837, not Turton; +*Schizothærus* Conrad, 1853, (about three weeks after Gray); type:

Tresus nuttallii Conrad, 1837. Sitka to San Diego, Cal.

+*Lutraria maxima* Midd., 1849, non Jonas, 1844; +*L. capax* Gould, 1850; +*L. inflata* Dunker, 1853.

Genus **DARINA** Gray, 1853.

Darina declivis Cpr., 1865. "Vancouver;" "Forbes;" fide Cpr.

DOUBTFUL OR SPURIOUS WEST AMERICAN SPECIES OF MACTRIDÆ.

There is no typical *Mactra* or *Spisula* known from the Pacific Coast.

Mactra angusta Desh., 1854, from the Gulf of California as figured by Reeve, resembles a refined *M. californica* Conr. Weinkauff's figure is undoubted *californica* Conr. not Desh. I have not seen authentic specimens.

Mulinia bistrigata Mörch, 1861, appears to be a mere color variety of *M. pallida.*

Mulinia Gabbi Tryon, is stated to have come from Lower California, but has not since been reported from there. It is very close to the South American *M. exalbida* Gray, and as *M. exalbida* is found near Panama it may reach California.

Mactrella subalata Mörch, 1861, was described from a single worn valve obtained at Realejo, Costa Rica. This was probably a ballast shell or one in some way transported from the Atlantic Coast. Caribbean shells are taken to Panama and other Pacific ports for sale to visitors, as I have personally experienced. *Mactrella alata*, of which *subalata* is a pure synonym, has not been authenticated from the Pacific where it is replaced by *M. exoleta* Gray.

M. (Mactrella) lacinata Cpr., 1856; Panama, Bridges; is probably a *Mulinia*, notwithstanding its reference to *Mactrella.* Its small size (0·7 in.) points toward immaturity. It has not been

figured or sufficiently described to enable it to be referred to its proper place in the family.

Lutraria Sieboldii Desh., 1854; "Vancouver Id., Kellett"; is a Japanese species, with which *L. lucida* Gld., 1861, (a young shell) is probably synonymous.

Darina declivis Cpr., 1865, has not been found by any collector on the N. W. coast since reported from a collection alleged to have been made by Dr. Forbes, R. N., but which had passed through the hands of a dealer. The same lot contained a shell described by Dr. Carpenter under the name of *Saxidomus brevisiphonatus*, which also has not subsequently been discovered in the region.

[Errata. July NAUTILUS at foot of p. 28, should read: *Mactra Cumingiana* "Bush," Zool. Rec., 1885, from Cape Hatteras, is a *lapsus* of the Recorder for *Macha Cumingiana*.]

April 15, 1894.

A FEW NOTES ON HELIX TRIDENTATA.

BY A. G. WETHERBY.

I have recently received from Mr. Pilsbry his Critical List of Mollusks collected in the Potomac Valley. Proc. Acad. Sci., Phila., 1894, pp. 11 to 31, with plate.

This is a valuable and interesting contribution from this indefatigable worker. But he has again dropped into the business of adding latin names to varieties of our common shells, so that we now have from Say's species no less than three trinominal relations, viz., *H. tridentata edentilabris; H. tridentata juxtidens* and *H. tridentata frandulenta*. I propose, in this note, to briefly review this case, as Mr. Pilsbry, having the spirit of the true naturalist, has kindly opened his pages for that purpose.

This species, though exhibiting so many variations, due to differences of station, or to inherited race proclivities, has always a general facies that marks it well. No student of our land shells *need ever* or *does ever*, mistake it for anything else. It cannot be confounded with *H. fallax* Say, though Dr. Binney believed them to be identical; nor is there any other North American species, worth anything as such, that need be taken for it. Now with this fact well

before us, I wish to use this criticism of these unnecessary names to illustrate the suggestions as to labeling such shells, made in my notes on *H. appressa* in the June NAUTILUS. The chief forms of *H. tridentata* in my collection are the following:

The type, from many localities in many States; I need not cite them here.

A variety found under the shingle and waste of the limestone cliffs about Cincinnati. This shell is characterized by its very light color, horny texture, polished appearance, comparatively few and little impressed striæ, and the aperture of Pilsbry's *juxtidens*.

A variety found on Braden Mt. in Campbell Co., Tenn., of very large size, very much depressed, deeply sculptured and with the denticles little developed and remote.

A smooth variety from Whitley Co., Ky., with polished surface, striæ very little impressed, aperture nearly circular, almost without denticles.

A variety from Putnam Co., W. Va., very small, with all the mouth parts approximated, but not like Pilsbry's *fraudulenta*. This is a most interesting form, and as widely separated from the last as it well could be.

A variety from Cherokee Co., N. C., with all the characters of *juxtidens* but with the mouth parts cupped like *H. fallax*.

Now I do not hesitate to affirm that in these lots are every gradation necessary to unite them with the type. This is a matter of the eye simply. Now what shall we do? Shall we label the first form *H. tridentata polita*, the second *H. tridentata edentilabris* or what not, and so on to the end, or shall we say for the first *H. tridentata* Say, var. Cincinnati, O., and for the second *H. tridentata* Say, var. Campbell Co., Tenn.? and so on to the end. The first method loads up our literature with trinominal designations of varieties *that fix a limit just as rigid as a specific name.* The second method is in accordance with nature and the facts in the case. They are varieties, uniting each other, through the gradations in each, with the type. What is a "*subspecies*"? I undertake to say that there is no such thing in nature whatever. We may have species; we certainly have no "*subspecies*." The moment the specific line is passed, if any exists, that instant we are in the realm of variations, inhabited only by varieties. To name these varieties is to make types of them as rigid as the specific type itself. If not, *why name them?* If so, why

call them varieties or "*subspecies*," endeavoring in this way to dodge a dangerous breaker?

As the humblest student of these beautiful and variable forms of molluscan life, I shall not cease, upon every opportunity, to enter vigorous protest against these inversions of the natural order in development.

As there are no such things in nature as subspecific or varietal barriers, so there should be none in the literature devoted to her record.

Here may the educated finer sense, the critical insight, the intense love of truth, the most unbounded capacity for labor, the acumen derived from the union and cultivation of all these, find wholesome employment and scope for all legitimate ambitions.

This is better than erecting obstructions in this highway of the omnipotent, that must crumble of their own inherent falsity.

Magnetic City, N. C.

ON CHITON HARTWEGII CPR. AND ITS ALLIES.

BY H. A. PILSBRY.

In the "Proceedings of the Zoological Society of London" for 1855, Dr. P. P. Carpenter described a number of West American Chitons, now mostly well-known to western naturalists, among them *C. Hartwegii* and *C. Nuttalli*. The descriptions though concise are excellently worded, leaving no doubt of the exact forms intended; for Carpenter was an adept in the art of writing diagnoses. In his later publications on the shells of this fauna, the systematic position of these species caused Carpenter some trouble; for he refers them to both *Trachydermon* and *Chætopleura*; and the difficulty of placing them in either of these genera caused the present writer to make a new group, CYANOPLAX (in allusion to the color of the interior), to contain them. There cannot be much doubt that *Cyanoplax* is a subgenus of the Carpenterian genus TRACHYDERMON. The species *Hartwegii* was founded upon specimens collected at Monterey by Hartweg (whom Carpenter is pleased to call "*diligentissimus*"). The type measured about 31x19 mm. (1·26x·76

inch), and agreed in its rather long and narrow form and impressed sutures with fig. 85 of plate 14 of the Manual of Conchology.

The *Nuttalli* (named in honor of the naturalist whose name is so familiar to botanist, conchologist and ornithologist alike) was collected at the same locality, and was stated to differ in being wider, depressed, the valves squared where they join the girdle, the latter not projecting between them to form deep sutures. The type measured about 26½x20 mm. This is the form figured by me on pl. 14, fig. 84 of the Manual.

It is not at all difficult to pick out specimens of this short, broad form, or of the longer, narrower form, even more pronounced in character than Carpenter's types; but trouble begins when we come to the intermediate examples. In one lot of 18 specimens recently received from Miss Shepard, 6 are typical *Nuttalli;* 8 are more or less typical *Hartwegii;* but it would puzzle a Philadelphia lawyer (or conchologist either) to tell what the other specimens are. The same extremes and intermediates occur in many other trays of specimens I have seen from various localities; so that one cannot doubt that the two forms named by Carpenter are merely the variations of one species, and are not correlated with differences of station or geographic range.

All of the specimens are dull greenish, gray or even black, the lighter forms generally having a row of dark blotches on each side of the dorsal ridge; and seen under a lens, all are minutely but sharply granulated, with coarser granules scattered irregularly over and among the smaller ones, especially on the lateral areas; and they are all rather deep colored inside, varying from " Robin-egg " to " Catbird-egg " blue.

Some months ago, the writer received from Mr. W. J. Raymond, fourteen specimens of *Cyanoplax*, which differ so markedly from the species discussed above that that they must form a distinct species. After reaching this conclusion the shells were put aside, for one is slow to describe new littoral shells from so well worked a locality as middle California; but renewed study of them convinces me of the necessity of the step.

Trachydermon (Cyanoplax) Raymondi n. sp.

Shell longer and narrower than *T. Hartwegii.* Back somewhat keeled, varying in elevation. Color (1) olivaceous green mottled with white, sometimes with dark lateral streaks as in *Hartwegii,*

sometimes ruddy at the ridge, or (2) uniform blackish, or (3) dark brown, uniform or with whitish flecks.

Valves rather strong, slightly beaked when unworn, the posterior (sutural) margins straight or slightly concave. Intermediate valves rather rounded where they join the girdle, scalloping the inner border of the latter; not distinctly divided into areas. Lateral areas hardly or not raised (the diagonal being indistinct) *evenly sculptured with minute, equal granules.* Central areas also evenly sculptured throughout with similar granules, slightly finer on the ridge. End valves with the same equal sculpture, the tail valve with the mucro central and a little projecting.

Interior light blue, with darker stains at bases of the sutural laminæ and behind the rather strong blue-white valve callus. Sinus and sutural laminæ as in *Hartwegii.* Slits in valve i, 8; valves ii–vii, 1–1; valve viii, 11; teeth of end valves blunt, thick, but not distinctly bilobed. All teeth longer than the narrow, porous eaves.

Girdle narrow, black or with small whitish spots, leathery, very minutely papillose.

Length 23, breadth 11 mm. (type; San Francisco).

Length 12½, breadth 7 mm. (Bolinas specimen).

Habitat, San Francisco, Bolinas, Purissima, San Mateo Co., Monterey, with typical *Hartwegii.*

Specimens from the first three localities were collected by Mr. W. J. Raymond, who has seen them from Monterey also.

This is a longer species than *T. dentiens* Gld., with heavier valves, less apparent diagonal, and much longer, thicker teeth. It differs from *T. Hartwegii* (to use Mr. Raymond's words) in being (*a*) "narrower and smaller than southern *Hartwegii* (Monterey to San Diego) with which alone I have been able to compare them from the material at hand; (*b*) the color of the inside is lighter blue than in *Hartwegii;* (*c*) I cannot make out the warty sculpture, which you emphasize in the description of *Hartwegii.*" Moreover, *the teeth are much longer* than in *Hartwegii,* from which the finer, *even* granulation well distinguishes *T. Raymondi.*

NOTICES OF NEW JAPANESE MOLLUSKS.

BY H. A. PILSBRY.

Clausilia (Stereophædusa) Stearnsii n. sp.

Shell elongated, regularly tapering, the next to the last and the

last whorl widest, the latter hardly contracted below; moderately solid, closely, lightly striated, the striæ wanting on the earlier whorls, more distinct and spaced on the latter part of the last whorl. Color opaque purplish-brown. Whorls 12–13, but slightly convex, separated by a shallow, simple suture. Aperture contained $4\frac{1}{2}$ to $4\frac{5}{6}$ times in length of shell; peristome reflexed, whitish, slightly thickened, not adnate; superior lamella strong, extending to the lip-edge; inferior lamella deep-seated, parallel to the superior, invisible from the front; subcolumellar lamella extending to lip-edge, bounded by grooves; palatal plicæ two, the upper one long, second rather short, with a thin white subvertical callus below it, which is strengthened below into a low bar.

Alt. 31, greatest diameter of last whorl above aperture 5 mill.

Alt. 26, greatest diameter of last whorl above aperture 5 mill.

Yaeyama (Okinawa), Loo Choo Is. (Fr. Stearns).

Believing this species to be new, I sent examples to Prof. Dr. O. Boettger, the great authority on these shells, and received the following emphatic confirmation of my opinion: "Die *Clausilia* von Okinawa ist *ohne jeden Zweifel* n. sp. Es ist eine *Stereophædusa* und steht in der Mitte zwischen *japonica* Crosse und *brevior* v. Mts."

No similar form has hitherto been reported from the Liu Kiu group, the nearest allies of the species being Japanese. It is named in honor of my friend Frederick Stearns of Detroit, who has contributed so largely to our knowledge of the Japanese fauna. The specimens vary considerable in length, but not in other characters.

GENERAL NOTES.

Mr. Wm. B. Marshall, who has been doing good work in the department of Zoology of the New York State Museum (Albany), has accepted the chair of Biology in Lafayette College, Easton, Penna.

The peculiar shell described in the June Nautilus as *Perostylus*, proves to be the larval form of *Fusus proboscidiferus*. A paper on the subject will appear in the September number.

THE NAUTILUS.

VOL. VIII. SEPTEMBER, 1894. No. 5

REMARKS ON THE STATUS OF SPECIES AND SUBSPECIES.

BY H. A. PILSBRY.

In several articles published in recent issues of this journal, a conchologist as well known for his wide experience in the field as for the vigor and point of his fluent pen, has been at some pains to criticise certain work by the writer, on American land shells. Several newly named varieties of well known shells are particularly obnoxious to my good friend; and in another place[1] he attacks the recent systems of classification of land shells, darkly hinting at certain tabulated results which he fancies would astonish systematists. Now in view of the amount of ink wasted over the questions of SPECIES, VARIETIES and CLASSIFICATION, it may be worth while to point out a few of the facts in the case; to show the futility of arguing on the abstract question of species, and incidentally to call attention to some of Mr. Wetherby's mistakes in dealing with certain varieties described by myself.

Mr. Wetherby says: "we may have species; we certainly have no subspecies." Now the truth is that *Nature* knows nothing of "species" or "subspecies," but only *individuals*. All *groups* of individuals are conventional and artificial. Were the record of palæontology complete, almost the entire mass of living individuals would be found to be connected throughout by intermediate forms. Not only would most of the *species* intergrade, but the genera, families

[1]Land Shells of Roan Mt. and Vicinity, Journal Cin. Soc. N. H.

and orders likewise. I say "most" because some would not intergrade; for contrary to the old adage, nature *does* sometimes jump. The theory of descent, and the connection of distinct, recent species by their extinct ancestors being admitted, we may next inquire what convenient artificial limits may be erected to defined the "species;" for all scientific investigation would be at a stand still if we have no names whereby to designate the various organisms about us. Probably the only definition of any use is that a species is any assemblage of similar individuals of presumably common ancestry, which cannot be connected by living intermediate specimens with other groups of individuals. It is the break in the chain which allows us to constitute the species; and whether this break be wide or narrow is of little importance so long as no recent organisms intermediate in characters are known.[2] However this idea may be worded, there is no possible foundation for species on any other basis. Now, many species, especially those having a wide range of distribution, show in some parts of their range considerable modifications usually correllated with peculiarities of climate, soil, or other factors known or unknown of their environment. These modifications are often sufficient for specific separation were it not for the fact that in some localities the links connecting the extreme forms occur. We have here species in process of making, waiting only for the extinction of the intermediate individuals or for the further intensification of the differential characters, to become full-fledged specific types. It is obvious that science must take cognizance of these incipient species, if it is to be a true record of nature; and for this reason "subspecies" or "varieties" are recognized. Of course they "run into" each other in some part of their range, otherwise they would be *species.* To ignore these varietal forms would be not removing obstructions from "the high-way of the Omnipotent" as Mr. Wetherby says, but a piece of the most pedantic falsity. The far-reaching importance of these local or geographic "subspecies" will be recognized when we understand that in them we have the material of future species in the making. We have moved away from the Darwinian conception that species have arisen from favorable variations of occasional individuals, preserved by the action of natural selection or "survival of the fittest"; and now we see much reason to believe that the whole mass of individuals over a given area of changed or changing conditions, is simultaneously remoulded, not

[2]The question of hybrids need not be considered here for obvious reasons.

by *individual variations* (which must usually be quickly effaced by interbreeding with normal or differently modified individuals), but by the steady action on the entire mass of the factors of climate, elevation, food-plants, currents and other quantities of the complex equation unknown to us.[3]

Mr. Wetherby proposes to avoid the use of subspecific or varietal names by the circuitous method of writing the *locality* after the specific name. He would say "*H. tridentata* Say, var. Campbell Co., Tenn." "*H. tridentata* var. Cincinnati, O." "*H. cereolus* var. Sanford, Fla." etc. Now the disadvantage of this system is that it tells absolutely nothing to the man who has no specimens from those exact localities, without a detailed description of the shells in each case. Moreover, Mr. Wetherby would write "*H. appressa* var. Woodville, Ala." for both *H. appressa perigrapta* and *H. sargentiana*, two very dissimilar forms. Who would know which one he meant to indicate? The trinomial system on the other hand offers a convenient, concise, readily understood index to geographic and local races. When one says "*P. cereolus septemvolva*" the idea is conveyed as exactly and much more concisely than by saying "*P. cereolus* large var. St. Augustine," for unless one has specimens from this locality he would not then know just what was meant. Again, were one to say "*P. cereolus* small var. Sanford, Fla." nobody could tell whether the variety found there was that with an internal lamina (*P. cereolus carpenteriana*) or without a lamina (*P. cereolus volvoxis*). Now what is the use in all this circumlocution when we have so convenient a system of nomenclature as the trinomial system, already in practical use in other departments of zoology.

Having discussed the abstract questions at issue at such length, we can devote but little space to the particular cases cited by Mr. Wetherby; but this is the less needful because what we wish to establish is the great importance of subspecies in general, not of any particular one of our own naming. We may, however, re-affirm the

[3] One of the most potent causes of specific or varietal differentiation has been the glacial epoch, which undoubtedly caused a southward movement of the entire northern fauna. Upon the recession of the ice sheet the species thus driven south found themselves exposed to changing climate and food-plants in their new home. Those following the retreat of the ice found the topography, soil and drainage systems of their former area in the north vastly changed. What wonder that we find many geographic subspecies! And shall we shut our eyes to the results upon our snails of the action of these cosmic forces, these manifestations of the Omnipotent?

reality of the distinction between the mass of southern, and the northern specimens of *P. appressa*. The northern shells described by Say have no incised spirals whatever, and the upper lip-tooth is frequently developed. The southern specimens (which we have called *P. appressa perigrapta*), have spiral incised lines more or less developed, and the upper tooth is wanting in the vast majority of cases. When it is present, as in the Cherokee Co., N. C. examples mentioned by Mr. Wetherby, I would regard it as an interesting case of reversion.

As to *Polygyra tridentata*, Mr. Wetherby has not read my paper with sufficient care to see my meaning. He attacks my *P. fraudulenta*, but says in the next sentence that *P. fallax* is perfectly distinct from *tridentata*. The truth is that *Helix fallax* of Wetherby and other modern authors and collectors *is identical with my fraudulenta!* The true *H. fallax* of Say is identical with *H. introferens* Bland, as I have already stated in this journal and elsewhere. So my critic discredits and affirms the validity of this form in one article! As to *P. tridentata edentilabris*, Mr. Wetherby has evidently never seen it. The var. *juxtidens* is a well-known form. I believe it to be a distinct line of differentiation, well worth attention and recognition by name.

I have not referred in this article to the large class of individual variations such as is shown in the banding of many Helices. This mode of variation is often repeated, different species having parallel modifications. The mutations are frequently not inherited, any of the forms giving birth to numerous others, as is the case with the band-varieties of *Helix nemoralis*. This tendency to "sport" in all directions is a totally different thing from the moulding of an entire race explained above; and its products cannot usefully be given varietal names. They are best expressed by formulæ devised to cover entire classes of such variations.

TYPES OF ANODONTA DEJECTA REDISCOVERED.

BY CHAS. T. SIMPSON.

In making a final arrangement of the general collection of *Unionidæ* of the National Museum I found the other day among some

Unios, Lewis' types of *Anodonta dejecta*. The species was furnished by Dr. H. C. Yarrow, Surgeon and Naturalist of the Wheeler Expedition, and was said to have come from the Arkansas or its tributaries, west of the 100th meridian. The lot consists of three broken valves, two of them forming a normal pair but very much distorted.

I saw in a moment that the shell I named *Anodonta mearnsiana* in the NAUTILUS, Vol. VI, no. 12, p. 134 was the same, and my name will therefore have to be relegated to the synonymy.

Lewis described his species in Field and Forest, Vol. 1, nos. 3 and 4, page 26, and in Wheeler's Report upon Geographical and Geological Explorations and Surveys West of the One Hundredth Meridian, vol. V, Zoology, p. 952, 1875, but did not figure it.

I am almost certain that the locality given by Dr. Yarrow is wrong, as the specimens collected by Dr. Mearns were from San Bernandino Ranch, Arizona, out of waters that drain into the Colorado River of the West. A very large number of specimens were sent, and there can be no doubt as to where they were found.

It would indeed be a strange thing if this species was obtained from two places seven or eight hundred miles apart, in two distinct drainage areas. As the locality given for Lewis' species is rather vague, and a large amount of the collections of the Wheeler Expedition were made on the Pacific slope it is quite probable that the types of *A. dejecta* came from the Colorado drainage basin.

Washington, D. C., Aug. 1st, 1894.

DESCRIPTIVE NOTICES OF NEW CHITONS, V.

BY H. A. PILSBRY.

Ischnochiton ptychius n. sp.

Shell small, oval, moderately elevated, with fine and distinct though rather obtuse dorsal keel and slightly convex side-slopes; bright *flesh-pink*, with a few white dots along the sutures, and creamy angular patches on the outer portions of the pleura of some valves, the girdle dull flesh-colored with indistinct whitish mottling in some places.

Median valves short, the posterior outlines slightly concave, with the beaks but slightly indicated. Lateral areas slightly raised, each

divided by one curved radial groove in front of the middle of the area, with one or several shorter, less distinct grooves in front of it; *concentrically sculptured with coarse, low, irregular wrinkles,* which make the sutural margin feebly dentate. Central areas finely and minutely sculptured with *irregularly zigzag transverse, vermiculate subgranose wrinkles,* which are broken into granules on the ridge, and are puncticulate, the outer portions of the pleura more coarsely wrinkled. Valve i having weak radial grooves and concentric wrinkles. Valve viii with central, low, mucro, the posterior slope somewhat concave; sculptured like the head-valve but more obsoletely.

Interior rose-pink, fading to white on the sutural laminæ. Sinus wide, notched at the bases of the sutural laminæ; eaves narrow and *distinctly porous.* Median valves with 1–1, tail valve 16 slits; teeth sharp, very *distinctly crenulated at the inner edge.*

Girdle wide, densely clothed with scales which are weakly striated, and measure about one-seventh of a millim. in width, and *imbricate inward and backward.*

Length 11, breadth 8 mm.

Hab. St. Vincent Gulf (Bednall).

A peculiar little species, shorter than most Australian *Ischnochitons,* and wrinkled much as in *I. striolatus* Gray. In the individual before me there are creamy patches at the outer ends of valves iv, v, vii and viii; on the last valve there is some olive-green variegation of the cream color.

Chiton (canaliculatus var. ?) tricostalis, n.

Allied to *C. canaliculatus* Q. & G. (+*insculptus* Ad. and *stangeri* Rv.) and *C. discolor* Souv. (+*miniaceus* Cpr.), but having fewer radial riblets on end valves and lateral areas than the first, and more elevated than *discolor,* with projecting, more backward-hooked mucro on the tail valve.

Shell oblong, elevated, acutely keeled with nearly straight side slopes. Color variable, either (1) uniform chrome yellow, or (2) olivaceous mottled finely with white, with some white patches on the lateral areas, the outer halves of the pleura blackish, girdle olivaceous with cream-white bars opposite the sutures.

Median valves a trifle beaked, the posterior (sutural) margins nearly straight. Lateral areas well raised, having three radial tuberculate riblets, the middle one shortest; tubercles rounded and spaced on front two ribs, closer and compressed on the posterior rib,

where they denticulate the sutures. Rarely a fourth very short rib is indicated on some valves. Central areas having a smooth dorsal band of about the same width in front and behind, or somewhat wider in front. Pleura having 14–15 longitudinal riblets, narrower than their intervals, the inner 1 to 3 on each side not reaching to the anterior margin of the valve. Head valve with 17–19 radiating tuberculate ribs. Posterior valve elevated, the mucro projecting, posterior slope concave. Interior milky bluish, the sutural laminæ white.

Girdle densely clothed with imbricating finely striated scales, shaped like those of *Chiton sinclairi* and measuring about one-third of a millim. in width.

Length 17, breadth 9 mill.; an olivaceous, variegated specimen is somewhat larger.

Hab. St. Vincent Gulf, S. Australia (W. T. Bednall).

This form differs from *C. muricatus* in the shape of the girdle scales. It is more roughly sculptured than *C. canaliculatus*, with the girdle-scales different in form, although they are about the same width; and with a different pattern of coloring, although in this respect all the allied forms of the *canaliculatus* group vary a good deal. The smooth dorsal band is wider than in *canaliculatus*.

It is somewhat doubtful whether this should be considered a geographic variety of the New Zealand species or an independent species. It is at all events closely allied to the *C. canaliculatus*, although actual connecting links between the two are unknown to me. The detail figures given in volume xiv of the Manual of Conchology (pl. 36, f. 4, 6) excellently represent the sculpture of *C. canaliculatus*, being drawn from a specimen furnished by Professor Hutton.

Chiton æreus var. **calliozona** n. var.

Shell oblong, elevated, the dorsal ridge acutely keeled, side-slopes straight; light olive-green, with a few concentric lighter streaks upon each valve, and obscure dusky-green longitudinal streaks on each side of valves ii and vi, less conspicuous on iii and v. Posterior (sutural) margin of valves i to vii articulated or tessellated, being painted with alternate white and brown oblique spots. Girdle buff, paler on the outer half of its width, variegated with *transverse bars of crimson and black scales* mingled with the buff ones; about 10 bars on each side.

Median valves scarcely beaked, the posterior outline of each concave. Lateral areas raised, sculptured with two or three radial grooves, becoming more numerous toward the bases, and inconspicuous growth-striæ. Central areas having a wide smooth triangle in the middle; *sculptured in front of each diagonal slope with narrow, spaced impressed longitudinal grooves*, not half as wide as the intervals, and which form a sculptured band, increasing but little in width outwards. *Toward the beaks of each valve these grooves disappear entirely, but are replaced by distinctly painted green lines*, very curiously simulating the grooves. Anterior valve with about 28 convex radial riblets, some split at base. Posterior valve with subcentral subprominent mucro, and slightly concave posterior slope, weakly radiated. Interior pale blue, the sutural laminæ white. Sinus very narrow.

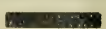
Girdle densely clothed with very convex, shining, polished solid scales, those in the middle of its breadth largest, measuring, six-tenths mill. in width.

Length 38, breadth 18 mill. (exclusive of girdle).

Hab. St. Vincent Gulf (W. T. Bednall).

I have not much doubt that this shell is a form of Reeve's *æreus*, but the coloration is different, the number of riblets on the pleura is not nearly so great. Mr. E. A. Smith has united *æreus* to the Mediterranean *C. siculus* (=*olivaceus*), but I can hardly endorse such a lumping of forms from totally different areas.

ISAIAH GREEGOR.



We have heard with deep regret of the death of Mr. Isaiah Greegor, which occurred on the 26th of July at his home, Cuyahoja Falls, Ohio.

Mr. Greegor was not only an extensive dealer in shells, but also an ardent and earnest Conchological student. Though for many years engaged in a business requiring strict attention and skilful management, he never allowed this to interfere with the promptings of his generous heart; a fact which was constantly exemplified by his timely suggestions and gifts of specimens to friends and others engaged in Conchological pursuits. He also took much interest in the completion of the American Association's collection. His last

gift to this,—some two months ago, was a number of Florida species; among them a suite of *Strombus alatus* Gmel., remarkable for their very large size and brilliant coloring; the latter ranging from the brightest crimson to the deepest purple. The presentation of this suite gave him a great deal of pleasure, and we shall never forget his gratified expression when he saw them safely placed.

How little did he then think that his eyes rested upon them for the last time!

"We mourn him dead, yet is he living."

[COMMUNICATED.]

NOTES AND NEWS.

TRACHYDERMON RAYMONDI IN BRITISH COLUMBIA.—Mr. C. F. Newcombe has found this species abundant at Victoria, on exposed headlands, its stations being similar to those of the Nuttallinas. It was formerly confused by collectors of that district with *Tr. dentiens*, young *Mopalia lignosa*, and young *Nuttallina scabra*. The occurrence of the latter species in British Columbia is extremely doubtful. *Trachydermon raymondi* will probably prove to have the distribution of *Nuttallina californica*, *Ischnochiton mertensii* and *Tonicella lineata*.

NOTE ON ORTHALICUS MELANOCHEILUS FLORIDENSIS.—In the reference to Land and F. W. Shells, N. A. (foot of p. 38) "fig. 371" should be omitted. That figure represents a shell from the Sierra Madra, and shows the conspicuous dark oblique stripe in the aperture characteristic of typical *melanocheilus*, and the spirals are very faint there. A good figure of the Florida shell has been given by Mr. Binney in "Fourth Supplement T. M. V," pl. 2, f. 4.

AGRIOLIMAX CAMPESTRIS IN NEW MEXICO.—Mr. A. Boyle has given me a specimen of *Agriolimax campestris* which he found in his garden at Santa Fé, about 7100 ft. above sea level. The specimen is pale brown, with a pale grey unicolorous sole. So far as I know, this is the first slug recorded from New Mexico.—*T. D. A. Cockerell.* July, 1894.

NEW METHOD OF PREVENTING CRACKING OF ANODONS.—EDS. NAUTILUS: All collectors are aware of the trouble we have

in preserving Anodons. No matter how good they may be, they won't stay so if they can only get to split up in pieces. Last spring a fish pond here was drained and I obtained a good lot of very fine large *Anodonta fluviatilis.* I washed them clean on Saturday and put them aside to dry, and when I came back Monday morning they were having a regular "pic-nic" splitting and popping. So I just gave them a bath of thin white shellac and alcohol and they have been behaving well ever since. I send you some specimens that you may see the effect it has on them.

Frank Burns, Washington, D. C.

[The specimens are still in good condition, and the plan is worth a further trial. The principle is that the shellac forms an impervious layer over the epidermis, preventing that evaporation of water from the latter which causes it to contract and break the thin calcareous layer. The shellac should therefore be applied as soon as the surface of the mussel is dry. Its main disadvantage is in the artificial gloss which it gives the shell, which would prevent its use on lusterless specimens. If the shellac is very thin it does not effect the appearance of glossy shells like *A. fluviatilis.*—Ed.]

Errata.—A typographical error occurred in the July number of the Nautilus and I desire to correct same. In the article "My Daily Walk" on page 34, the *second line under the list of species collected,* I notice the *ninth word* should have read as "county" and not "country."—*Williard M. Wood.*

NOTICES OF PUBLICATIONS RECEIVED.

Natural History Notes from North Carolina (Papers nos. 2 and 3) by A. G. Wetherby (from the Jour. Cincinnati Soc. Nat. Hist.). In these papers on "The Land Shells of Roan Mountain and Vicinity" the author enumerates fifty-four species with interesting notes on each. A parasitic species of Diptera is here recorded infesting *Zonites elliotti* and *Polygyra fustigans.*—*C. W. J.*

Geographic and Hypsometric Distribution of North American Viviparidæ by Prof. R. Ellsworth Call (from the American Jour. of Science for August). This interesting article is accompanied by a map showing the distribution of each species. The

author recognizes two species of *Tulotoma* (*magnifica* and *coosaensis*), four of *Vivipara* (*contectoides, intertexta, subpurpurea, troostiana*), two *Lioplaces*, and nine species of *Campeloma*. The main facts of the distribution and station of each species are stated, largely from the authors own wide experience in the field. It would be unreasonable to expect any discussion of synonymy in a paper of the scope of this one, but even if Prof. Call could prove the specific identity of *Vivipara contectoides* with *georgiana, wareana*, etc., why should he use the *latest* instead of the *earliest* name for the species? —*J. & P.*

Dr. Wm. H. Dall has recently issued a "Monograph of the Genus Gnathodon, Gray (Rangia Desm.)." In this essay the priority of the name *Gnathodon* for the group is demonstrated; the anatomy of both soft and hard parts is described, and the species are discussed and figured. Dall concludes that *Gnathodon* does not constitute a distinct family near *Cyrenidæ*, as Fischer has it, but that it belongs without doubt to *Mactridæ* and is probably an off-shoot from the *Mulinia* stock. The range of the genus is "Subtropical America, the Gulfs of California and Mexico, in shoal quiet water, varying from salt to fresh, but preferably somewhat brackish; range in time from the newer Miocene to recent seas." Three sections are adopted, *Gnathodon* typical, *Miorangia* Dall and *Rangianella* Conr. *G. cuneatus* Gray is the commonest species in collections (often under the name *Rangia cyrenoides*).

The Mollusca of the Paris Mains.—M. Locard has been making some very interesting studies of the mollusks of the water-mains of Paris, from which he has collected forty-four species belonging to thirteen genera, among which several species are described as new to science. These are, however, only slight varieties of well known species. Among other peculiarities of this strange fauna he notes four marked modifications, due to their environment, in which they differ from the types in the waters from which these mains are supplied. These are: [1] A diminution of size, due to the absence of light; [2] a decrease of marked coloration, due to the same cause; [3] decided modifications of form, generally producing a lengthened shell, due to the mechanical action of a steady and rapid current; [4] difference of general appearance, the polished, brilliant shell being developed with regularity in a constant medium. The last two peculiarities may be noticed in the shell life of those streams in tropical countries which in the shaded mountains are constant; as

differentiated from the formation and appearance of members of the same species found in the periodic streams of the open plains, which disappear with each recurrence of the dry season.

On the Jamaican Species of Veronicella, by Prof. T. D. A. Cockerell and R. R. Larkin. (Journ. of Malac. III, pt. 2, 1894). The material discussed in this paper consists of 18 specimens, all referred to *V. sloanii*, from Jamaica. These were dissected and their characters carefully noted. The conclusions reached are of much value to investigators of this difficult genus. "The results obtained are quite remarkable and tend to throw doubt on the validity of several characters hitherto used for the separation of species in the genus * * * The specimens show great differences from one another, so that by selecting a few of the most distinct forms, several apparently good species might be described. Yet we believe that the whole series represents the variations of but one species, *V. sloanii*, and that *V. virgata* Ckll. must be reduced to *V. sloanii* var. *virgata*. * * notwithstanding so much variability, the species as now defined should be easy of recognition. The following characters appear to be quite constant and of specific value in *V. sloanii*. (1) The under-side is always free from spots or markings of any kind, whereas *occidentalis* Gldg. from the Lesser Antilles, has some spots below. (2) The sole never projects from behind the body, as it does in one or two of the continental species. (3) The filiform glands are less than 10 mill. long, whereas in *dissimilis* and *floridanus* they are considerable longer. (4) The penis is always long, cylindrical, with the end slightly bulbous and the orifice terminal. It thus entirely differs from that of such species as *V. portoricensis*. (5) The filiform glands are always more than 10 in number thus differing from *V. morchii* and *V. dubia*. (6) The female orifice is always post median, thus differing from the continental *V. nigra*, etc."

The characters of size and shape, distance of female orifice from head and sole, size of penis and splitting of its retractor, number and length of filiform glands etc., were found to vary within wide limits, and their several variations were not correllated in the different organs, so that no dependence could be placed upon the various combinations presented for specific distinctions. Color, contrary to the opinion of some authors, seems useful in some cases. The whole series examined is systematically tabulated; and the only thing lacking in this admirable paper is *illustration*. Still, this is a lazy complaint when all is so clearly described.

THE NAUTILUS.

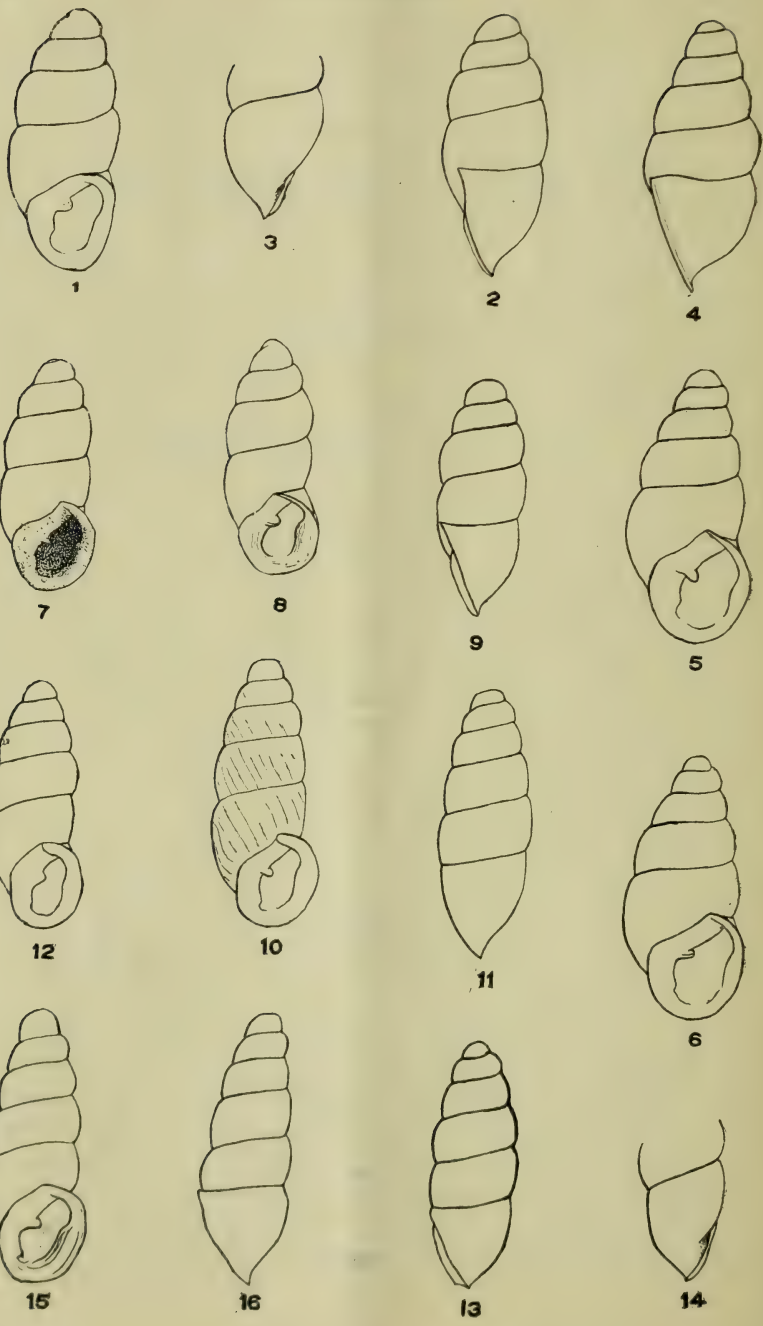
VOL. VIII. OCTOBER, 1894. No. 6

THE AMERICAN SPECIES OF CARYCHIUM.

BY HENRY A. PILSBRY.

The genus *Carychium* contains some of the smallest land mollusks known. The shell is cylindrical or high conical like that of *Pupa*, but the lack of eye-stalks and the form of the lingual teeth show the genus to belong to the family *Auriculidæ*, a group best known in America by the salt-marsh inhabiting *Melampus*. The species of *Carychium*, like other Auriculidæ, are terrestrial in habit, living among damp leaves or wood. The genus contains about 15 recent species, distributed over nearly the whole northern hemisphere.

In THE NAUTILUS for 1891, vol. iv, p. 109, the writer gave a brief notice of the United States forms of the genus. Subsequent study resulted in a synopsis of the group, which was published in Proc. Acad. Nat. Sci., Phila., 1891, p. 318, with plate xiv. With a view of enlisting the services of conchologists in the needed examination of more material from various parts of the country, this synopsis is here reprinted. Information is needed to establish the range of the various forms, particularly in the West and South, and also the variations of the several forms. Only the collection of specimens from points geographically intermediate between the extremes of the range of this genus, and the examination of such material by a competent person, can finally decide the question of the number of naturally defined species, and which, if any of them, must be considered geographic races or sub-species.


1
3
2
4
7
8
9
5
12
10
11
6
15
16
13
14

Carychium exiguum Say. Figs. 1, 2, 3.

Shell *cylindrical*, the last two whorls of about equal diameter. Whorls 4½. Aperture decidedly over one-third the total altitude. Outer lip sinuous, moderately thickened, very strongly arcuate at its upper outer portion.

This is the common East American form, ranging from Maine southward and westward, the limits of its range not exactly determined as yet.

Carychium exiguum var. **Mexicanum** Pilsbry. Figs. 7, 8, 9.

Shell cylindrical. Whorls 4½. Aperture equal to, or a trifle exceeding one-third the total altitude of shell. *Outer lip thickened at and below the middle by a very heavy deposit of callus upon its face.* Lower fold of the columella sub-obsolete. Surface delicately striated.

Orizaba, Mexico.

Carychium occidentalis Pilsbry. Figs. 4, 5, 6.

Shell *distinctly conical*, tapering. Whorls 5. Aperture very oblique, larger than in *C. exiguum*, the outer lip flatly expanded, thin, *not at all thickened on its face.*

Portland, Oregon, is the only locality from which I have seen this species.

Carychium exile H. C. Lea. Figs. 10, 11, 12, 13, 14.

Shell *elongated.* Whorls 5–5½. Aperture small, very oblique, about *one-third the length of the shell.* Outer lip more or less thickened. *Surface closely, regularly and very distinctly striated.*

Eastern Pennsylvania (H. C. Lea); Kent, Ohio (Geo. W. Dean).

Lea found this form on the Wissahickon Creek, near Philadelphia, but I have not been able to rediscover it there.

Carychium exile var. **Jamaicensis** Pilsbry. Figs. 15, 16.

Much elongated, similar to *C. exile*, but the surface smooth, not perceptibly striated.

Jamaica.

LIST OF SHELLS FROM THE VICINITY OF MINGUSVILLE, MONTANA.

BY HOMER SQUYER.

Many of the smaller forms were picked out of fine river drift found along the banks of Beaver Creek, a tributary of the Little Missouri, after the subsidence of the freshets.

The occurrence of *Pupa syngenes* Pils., previously known only from Arizona, and of *Planorbis umbilicatellus* Ckll., described and reported only from Manitoba, are especially interesting. Many of the forms were identified at the National Museum by Messrs. Dall and Simpson, while Dr. Sterki has kindly named the *Pupidæ* and Vallonias. Mingusville is two thousand six hundred and forty-five feet above sea level.

HELICACEA.

Family ZONITIDÆ.

Vitrea arborea Say; worn var., approaching *V. breweri* Newc.
Vitrea radiatula Alder, rare.
Conulus fulvus Drap., one specimen.
Pseudohyalina minuscula Binn.
Pseudohyalina læviuscula? Sterki. Close to vars. of *minuscula*.
Pseudohyalina conspecta Bland.

Family ENDODONTIDÆ.

Pyramidula striatella Anth.

Family HELICIDÆ.

Vallonia gracilicosta Reinh.
V. gracilicosta var. close to *costata* Say.
Vallonia perspectiva Sterki.
Vallonia pulchella Mull.

Family PUPIDÆ.

Pupa muscorum L.
Pupa blandi Morse.
Pupa blandi var. *edentata;* one specimen.
Pupa syngenes Pilsbry. Eight more or less perfect specimens.
Pupa holzingeri Sterki.
Pupa armifera Say.
Pupa pentodon Say.
Pupa decora Gould.
Vertigo ovata Say.
Vertigo binneyana Sterki.

SUCCINEACEA,

Family SUCCINEIDÆ.

Succinea avara Say.
Succinea obliqua Say.

Succinea grosvenori Lea.
Succinea lineata Binn.

LIMNÆACEA.

Family **LIMNÆIDÆ.**

Limnœa palustris Mull.
Limnœa bulimoides Lea.
Limnœa humilis Say.
Limnœa caperata Say.
Planorbis bicarinatus Say.
Planorbis lentus? Say; young shells only.
Planorbis parvus Say.
Planorbis umbilicatellus Cockerell; (*P. umbilicatus* Taylor, Leeds Journ. Conch. IV, p. 351, 1885, not of Müller, 1774). Described from Manitoba.

Family **ANCYLIDÆ.**

Ancylus rivularis Say, one specimen.

Family **PHYSIDÆ.**

Physa gyrina Say, young only.
Physa ancillaria Say.
Physa heterostropha Say.
Physa lordi Baird.

PELECYPODA.

Family **CORBICULIDÆ.**

Sphœrium sulcatum Lam.
Pisidium compressum Prime.

Family **UNIONIDÆ.**

Anodonta plana Lea, young.
Anodonta ovata Lea, young.

Only one perfect and adult specimen of *Planorbis umbilicatellus* was obtained in the river drift. It is readily distinguished from *P. parvus* Say by its narrow funnel-shaped umbilicus and higher, somewhat beveled whorls. It was first collected in Manitoba by R. M. Christy, Esq., and described by Taylor under a name already widely known in the literature though generally regarded as a synonym of one or another Linnean species. It was re-named by Cockerell, in the Conchologist's Exchange, November, 1887, p. 68. (W. H. D.).

NOTE ON HELCIONISCUS NIGRISQUAMATUS REEVE, SP.

BY GEO. W. TAYLOR.

I have recently received from Mr. Frederick Stearns of Detroit a number of shells collected by himself and labelled as follows:

"*Patella boninensis*, Bonin Is."

"*Patella stearnsii*."

"*Patella* near *stearnsii*, Japan, 1892, only 8 found."

"*Patella nigrisquamata* (?), Loo Choo Is., Yacyama Is."

"*Patella nigrisquamata* (?), a var., Japan, 1892."

All the specimens sent are, in my opinion, referable to a single species which has long had a place in my cabinet as *H. nigrisquamatus* Reeve.

Reeve's locality for this species was "Australia," but this has never been confirmed and is doubtless an error. The same I think must be said of the additional locality, "Concepcion Chili," given by Mr. Pilsbry (in the Manual, XIII, 126), on the authority of Dr. W. S. W. Ruschenberger, for we cannot concede to any limpet a range so extensive as from Japan to Chili, and Japanese shells of which I am now writing are certainly true *nigrisquamatus* if figures and descriptions count for anything. I may add as negative evidence of a certain value that of several thousands of limpets from Chilian and Australian localities that have passed through my hands, I have never seen a specimen, young or old, approaching this species.

With regard to *P. boninensis*, the differences on which Mr. Pilsbry relies are 3 in number (see Man. Conch. XIII, 132). The first *geographical;* but as *nigrisquamatns* has ~~not~~ been found in the same habitat as the original specimens of *boninensis* this distinction no longer holds. Secondly, the *size of the central callus;* but such a difference would hardly be specific, taken by itself, I should think, and moreover, it is not apparent in the series before me. Lastly, Mr. Pilsbry notes the *brown streaks* diverging from the head segment of the central callus. These marks, however, are present in some of the specimens sent as *nigrisquamata* and absent in others sent as *boninensis*, showing either that the original collector was unable to separate his shells accurately or else that the distinction is not a constant one.

+ See p. 118 at bottom.

As to *P. stearnsii*, if the shells sent to me by Mr. Stearns are conspecific with the type specimens named and figured (from his collection) by Mr. Pilsbry, then in my opinion *stearnsii* is only a young form of *nigrisquamata* and I suspect (from the description) that *Patella grata* of Gould is the same shell. I am, therefore, inclined to write:

Helcioniscus nigrisquamatus Reeve (Patella), 1854.
= ? P. mazatlandica Sowb., 1831.
= P. grata Gould, 1859.
= P. boninensis+P. Stearnsii Pilsbry, 1891.

Habitat: Japanese Seas, Stearns; "Australia," Reeve, error; "Chili," Ruschenberger, ? error.[1]

PEROSTYLUS, THE EMBRYO OF MEGALATRACTUS.

BY H. A. PILSBRY.

In a former number of this journal (June, 1894) the writer proposed a new genus, *Perostylus*, for the *Cerithium* (*Colina*) *brazieri* Tryon and another supposed new species. Upon the appearance of the paper describing these forms, I was informed by my encyclopedic friend, Professor Theodore Gill that the type of the new group had been shown by Professor R. Tate to be the embryonic portion of "*Fusus*" *proboscidiferus*. Some time after, the article by Tate, published in the Proc. Linnean Society of New South Wales (Australia), Second Series, Vol. VIII, pt. 2,[2] p. 244, came to hand.

In reference to *Cerithium* (*Colina*) *Brazieri*, Professor Tate writes: "The above named gastropodous shell is described in Tryon's Manual of Conchology, Vol. IX, p. 142, and illustrated t. 26, fig. 16. The occurrence of *Colina* in the Eocene beds of Victoria has led me to a study of the recent species, and in doing so I was arrested by the unlike-

[1] Mr. Taylor is unquestionably right in considering *Helcioniscus boninensis* a synonym of *nigrisquamatus* Rv. I had satisfied myself of this by the examination of the National Museum collection some years ago. He errs, however, in placing *H. stearnsii* in the same category as it is a totally distinct thing. Mr. Taylor probably had the young *H. nigrisquamata* before him, as so acute an observer could hardly confuse *stearnsii* with the other species.—Ed.

[2] Issued March 12, 1894.

ness of Tryon's figure, as above quoted, to other members of the genus; moreover, the shell seemed familiar to me, and if I am right in my identification it is nothing more than the embryo of *Fusus proboscidiferus*, of which I have examples from Port Essington. The apical whorls of that shell are often decollated, but in some specimens there remains sufficient of the apex to permit one to arrive at the opinion just stated."

If any further evidence is needed to demonstrate the true nature of *Perostylus*, it is supplied by Mr. Edgar A. Smith of the British Museum (Natural History), who writes to me as follows:

"The presence of a fine series of *Fusus proboscidiferus* Lamarck in the British Museum Collection, ranging from the very young state up to the adult form, enables me to show that *Perostylus* is merely the apical portion of the spire of that immense West and North Australian shell.

"The late Capt. Beckett brought from the Dampier Archipelago a number of specimens of this species besides a fine mass of the egg-capsules containing the young shells in large numbers. These agree exactly with the description and figure of *P. brazieri* (Tryon) and *P. fordianus* Pilsbry, as given by the latter author. The number of whorls in specimens from the same compartment of the mass of capsules is variable from four to six, and the length of the rostrum and canal is also subject to slight variation. Some specimens are also considerably broader than others. We have in the museum collection a specimen corresponding in size with Swainson's figure[1] of *Fusus aruanus* (=*probocidiferus*) with the apical whorls still remaining intact. Another example is nine inches in length and still retains the nucleus, but in all the larger shells this part is broken off.[2]

"The apical portion of *Turbinella pyrum* is also very similar, but a close examination reveals the incipient characteristic columellar folds.

"In the description of *Perostylus* the apex is said to be decollated like that of *Rumina* or *Cylindrella*. Whether this is really the the case has yet to be proved by further observation. There certainly is every appearance of there having been an embryonic shell which has become detached, but it is also certain that this takes

[1] Exotic Conchology.

[2] It is broken off in all the specimens in the Philadelphia collection.—P.

place within the egg-capsule, at an early stage of the creature's existence, for no such nucleus is attached to any of the specimens in the egg-capsules at hand which are of the same size as the shells figured by Mr. Pilsbry."

In conclusion it should be stated that *Fusus proboscidiferus* has been made the type of *Megalatractus*, a subgenus of *Hemifusus* (*Semifusus* Fischer!), by Fischer. There are good reasons for giving the group generic rank. It certainly does not belong to *Fusus*, the embryonic whorls being very different from those of the typical species of that genus. Neither can it be referred to *Hemifusus* as Fischer has done.[1] *Perostylus* will, of course, become a synonym of Fischer's group.

CATALOGUE OF LAND SHELLS OF LONG ISLAND, N. Y.

BY HENRY PRIME.

The time in making this collection embraces a number of years and I think it to be rather complete, having left no stone (or log) unturned in searching for the species. *Mesodon albolabris* and *thyroides* are dwarfed, and *Tachea nemoralis* does not compare as to size with those from Europe. The sea air may have something to do with this. The soil is of a sandy nature, as a rule, not adapted to the growth of sand snails.

Hyalinia arborea Say. Coldspring; Greenport; East Hampton; Huntington; Prospect Park, Brooklyn; Astoria; Myrtle Ave. Park, Brooklyn; Lloyd's Neck; Centerport.

Hyalinia binneyana Morse. Huntington.

Hyalinia cellaria Müll. Astoria.

Hyalinia indentata Say. Huntington.

Hyalinia milium Morse. Huntington.

Hyalinia nitida Müll. New Lotts.

Limax agrestis Müll. Jamaica; Brooklyn; Huntington; Centerport.

Limax campestris Binn. Lloyd's Neck; Whitestone; Centerport.

[1] Manuel de Conch. p. 623.

Limax flavus Linn. Huntington. Was introduced in egg state among mushroom spawn. Brooklyn.

Limax maximus Linn. Brooklyn.

Patula alternata Say. Richmond Hill; Lloyd's Neck.

Tebennophorus carolinensis, Bosc. Lloyd's Neck.

Pallifera dorsalis Binn. Lloyd's Neck.

Helicodiscus lineatus Say. Brooklyn; Huntington; Lloyd's Neck; Centerport.

Pupa contracta Say. Huntington; Lloyd's Neck.

Pupa corticaria, Say. Huntington.

Pupa fallax Say. East Marion; Coldspring. At Coldspring this species was at one time quite abundant among the brick (of what was left of a house cellar); these being removed the colony was broken up!

Pupa pentodon Say. Huntington.

Vertigo milium Gld. Coldspring.

Vertigo ovata Say. Shelter Island; Greenport; Coldspring; Huntington; East Marion; Myrtle Ave., Prospect Park, Brooklyn; Centerport.

Strobila labyrinthica Say. Huntington; Lloyd's Neck; Centerport.

Triodopsis introferens Bld. New Lotts. *Two* specimens were found *without the animal*, might they have been the playthings of some children?

Mesodon albolabris Say. New Lotts; Huntington; Oyster Bay; Prospect Park, Brooklyn.

Mesodon thyroides Say. Lloyd's Neck; Prospect Park, Brooklyn; Astoria; Huntington; New Lotts; Richmond Hill.

Vallonia pulchella Müll. Huntington; Centerport; Coldspring; Prospect Park, Brooklyn.

Tachea nemoralis. Yellow, plain, Flushing; yellow, 2 bands, Astoria; yellow, 4 bands, Flushing. A colony existed sometime since on Lloyd's Neck, but that locality being used as a public picnic ground, they in time *removed*.

Punctum minutissimum Lea. Coldspring.

Succinea avara Say. Coldspring.

Succinea aurea? Lea. Peconic.

Carychium exiguum Say. Huntington; Centerport.

Melampus bidentatus Say. Lloyd's Neck; Huntington; Whitestone; Coney Island; Eaton's Neck.

GENERAL NOTES.

With the cooler weather of autumn conchologists will find indoor operations once more agreeable, and all who have availed themselves of the past season for adding to their knowledge of mollusk life or to their cabinets of specimens should try to share their harvests with others by telling of the interesting experiences in the field, of the occurrence of uncommon species or varieties, or the turning up of well known ones in new localities. Frequently random observations on the life habits of one or a few species are valuable. Who knows where most of our marine or land snails lay their eggs, how many there are, their form and size? And yet this is a vital point in the life of the species; and there are hundreds of others, some of which are sure to come to the knowledge of every collector. The difficulty is that such facts are too often esteemed of less worth than a fine lot of shells, and so are forgotten and left half seen or unrecorded. A collector's note-book should be as valuable as his cabinet, especially if the knack of sketching living animals, etc., is cultivated.

We hope that each of our readers will give us some fact or observation which has been made his or her own, during the past summer. Short notes dealing with single topics are always welcome, and have the advantage of being published promptly. Such a magazine as this one is always co-operative, and the more each gives, the more each receives. If anything you have seen interests *you* it is likely to be of value to others: but being interested one's self is a good test of what makes good reading. Meantime the editors will try do their part. In future, more attention will be given to notices of current literature of conchology than has been our custom in the past; and it is of course understood that our pages are freely open to all opinions, entirely regardless of those held by ourselves.

The Junior Editor of the Nautilus will be away from Philadelphia for some time after the middle of October, as he contemplates a palæontological trip to Alabama.

Note on Helix gossei.—As the identity of this species is somewhat obscure, it may be well to clear it up in this place. *Helix gossei* was first described by Pfeiffer in the Proc. Zool. Soc. Lond., for 1846, p. 37, the description being repeated in Monographia, I, p. 30. In the later Conchylien Cabinet, *Helix*, p. 219, Pfeiffer de-

clared it to be a mere color variety of *H. subconica* C. B. Ad., described in 1845, and the figure he gives of his type amply confirms this opinion. In the Conchylien Cabinet, a few pages further on, Pfeiffer describes and figures a "*Helix gossei* C. B. Adams MSS." This name, of course, cannot stand, being preoccupied by that prior *H. gossei* of Pfeiffer himself, and this decision is not affected by the fact that Pfeiffer's first *gossei* is a synonym. This *gossei* of (C. B. Ad.) Pfr., I consider a race or variety of *H. nemoraloides* C. B. Ad., 1845, and it is practically covered by C. B. Adams' *H. pulchrior*, 1851. It is this form which caused Messrs. Simpson and Henderson some trouble in NAUTILUS for May, 1894, p. 5. The conclusion is that neither of the "gosseis" can stand, the first *gossei* of Pfr. being a synonym of *subconica*, and *gossei* C. B. Ad. MS. of Pfr. (later) becoming a synonym of *H. nemoraloides var. pulchrior.*—*Pilsbry.*

HELICES CARRIED BY BIRDS.—"From the throat of *Rallus pectoralis* Mr. J. A. Thorpe of the Australian Museum extracted the snail I now exhibit. This is a specimen of *Chloritis jervisensis* Quoy and Gaimard, a species common in this neighborhood, whose almost adult and uninjured shell measures 18 mm. in diameter, and which weighed, shell and animal together, 1·26 grammes. When found by Mr. Thorpe, to whom I am indebted for both facts and specimen, the snail was quite dead; as a test I immersed the animal in strong spirits without inducing contraction; since, however, its consumer had been killed forty hours earlier, the suffocation of the mollusc was to be expected. The bird was shot at Randwick, near Sydney, on the 19th May, 1894, by Mr. Newcombe, Deputy Registrar-General. In enumerating "Means of Dispersal," Darwin observes (Origin of Species, 6th ed. p. 372): 'A bird in this interval [eighteen hours] might easily be blown to the distance of 500 miles, and hawks are known to look out for tired birds, and the contents of their torn crops might thus readily get scattered.' In view of the above incident, this suggests a means whereby the geographical range of *jervisensis* might be considerably extended." —*Charles Hedley, in Abstr. Proc. Linn. Soc. N. S. Wales, May* 30, 1894.

PROF. H. E. SARGENT who has been pursuing biological studies at the Chicago University, has returned to Woodville, Ala.

THE NAUTILUS.

VOL. VIII. NOVEMBER, 1894. No. 7

DESCRIPTION OF A NEW SPECIES OF DORIDIUM FROM PUGET SOUND.

BY W. H. DALL.

Among specimens of mollusks collected in Puget Sound by the Young Naturalists' Association of Seattle, Wash., and forwarded for identification by Prof. O. B. Johnson, was a species of *Doridium*, a genus new to the region, and detected by Miss Adella M. Parker, in whose honor, at the request of the society, it has been named. The specimens were dredged in 30 fathoms at Eagle Harbor, Puget Sound.

Doridium adellæ n. sp.

Animal naked, about 16 mm. long, of a dark plum color, mottled with fine vermiculate spots of golden yellow; general form that of *D. carnosum* Cuvier, but with a shorter velum, half as long as the body and transversely truncate behind; the posterior free portion of the mantle short, obscurely bilobed, and without a flagellum; front edge of the velum slightly excavated; parapodia wide, the sole slightly longer than the body; shell internal, subconical, white covered with a brownish epidermis; pillar strong, reflected with a deep grove outside of it, the basal end projecting spur-like; nucleus small, depressed.

The shell is more conical and the cycloid wall of it narrower than in *D. carnosum*, and the excavated pillar much more prominent.

See Ann. Mus. de Marseilles, Zool. t. II, p. 45, pl. 2, figs. 42–44, 1885.

EDITORIAL CORRESPONDENCE FROM ALABAMA.

The following paragraphs from a letter received from the junior Editor of the NAUTILUS, written from Claiborne, Alabama, under date of Oct. 18th, will be of interest to our readers:

"* * * I arrived here [Claiborne] last evening, seven days out from Selma. While waiting for a train at Selma, I took a stroll along the river. The steep bank of bluish gray clay, probably forty or fifty feet in height, tempted me to look for fossils. A small *Ostrea*, or *Gryphœa*, a *Pecten* resembling *Camptonectes burlingtonensis*, and several parts of a large *Inoceramus* told me it was cretaceous. But the specimens were too scarce and poor to warrant the expenditure of much time. From Selma I went by train to Catharine, and thence to Prairie Bluff.

"It is at the latter place that the collector of cretaceous fossils is in his element. The bluff is over one hundred feet high, and in one place slopes gradually, giving one a good opportunity to collect. Fine large specimens of *Exogyra costata* and *Gryphœa vesicularis* were abundant. The shells of the latter were unusually thick and the lower valve very convex. Perfect specimens of *Plicatula urticosa* were also common. Finely preserved casts and, in many cases, the shells of numerous species of *Gastropods*, were abundant. Exceptionally numerous were: *Anchura spirata, Turritella encrinoides, Rostellites texturatus, Pyropsis* sp., *Natica abyssina* and *Lunatia Halli*. Of the Cephalopods, I found *Nautilus DeKayi, Baculites ovatus* and *Ammonites* sp., in fair numbers.

"At Matthew's Landing, ten miles below Prairie Bluff, is the first good exposure of strata containing Eocene fossils. They are well preserved and very interesting, many that I found being new to the Philadelphia collection, *Cardita, Arca, Volutilithes, Pleurotoma*, being some of the principal genera. I found the spire of a large and handsome conch, reminding one of *Melongena corona*, except that the projections on the angles of the whorls are nodulose instead of spinose, but I looked in vain for a perfect specimen.

On the west bank of the river, a short distance below Clifton, are high bluffs of indurated blue clay, and I found the first (and

last, so far) *Strepomatidæ* of the trip, *Goniobasis solidula* Lea. The bank below the water-line was covered with them. In many places little springs trickled down the bank, and in these they were to be found to a height of twelve feet above the river level. Notwithstanding the very low stage of the river, I have seen no living *Unionidæ*, and only a few worn and faded valves on Burford's Bar.

"In the the bluff at Peach Tree there is a narrow stratum of ferrugineous sand containing a few Eocene fossils. Monday, the 15th, was spent at Gregg's Landing, four miles below Peach Tree. As there were no accommodations there for staying over night, we made every minute tell. It is a fascinating spot; great masses of a hard fossiliferous sandstone in which *Turritella mortoni* and *Ostrea compressirostris* predominate, and which has come from an upper stratum seventy or eighty feet above the present water-line, lay strewn along the base of the cliff, reminding one of Potomac Creek, Va. In the lower fossiliferous stratum, of a dark, indurate, sandy clay, *Cardita planicosta*, *Cucullæa* sp., *Turritella humerosa*, *Turritella* sp. and *Calyptræphora trinodosa*, were the conspicuous ous forms.

"Bell's Landing, five miles below Gregg's, was next visited. The fossils were similar to those found at Gregg's, but among them were many rare species—rare in collections and rare at Bell's Landing.

"It was indeed singular how many uniques of some very interesting forms I found here. The stratum referred to above was also present here, but the upper one was for the most part a soft sand, and contained a greater number of species. As it was impossible to work the upper stratum in place, and as both were mixed together in the talus at the base of the cliff, I found it impracticable to keep the fossils of the two separate. I have not had time to hunt for land shells, but from appearances it seems somewhat unfavorable. On the bluffs it is extremely dry, while the lowlands are subject to overflow. To-morrow I go to work at the Claiborne fossils. Yours sincerely,

"CHAS. W. JOHNSON."

POLYGYRA (STENOTREMA) HIRSUTA ON LONG ISLAND.

BY A. H. GARDNER, FORT HAMILTON, L. I., N. Y.

In the October number of the NAUTILUS I noted a catalogue of the land shells of Long Island, N. Y., by Mr. Henry Prime, which

seems, from my own investigations, to be very accurate. I venture, however, to supplement the same with a species hitherto unrecorded amongst the annals of the mollusk fauna of Long Island, and existing in what I believe to be a very circumscribed area. Most of the species Mr. Prime records I have found in localities other than those he names, and from his more extended investigations and those of his predecessors, Messrs. Temple Prime and Sanderson Smith—ranging over nearly the entire island—I am inclined to believe that the species of which I am about to write is to be found in but one locality, the one in which it was first discovered.

During the early spring of 1891 a colony of *Stenotrema hirsuta* was accidentally discovered by my friend, the late Mr. James Armstrong, a naturalist residing in Bay Ridge, L. I.; they were found in a small patch of woods, or rather, a small thicket, laying at right angles to a good-sized wood, at what is now 13th Ave. and 74th St., Brooklyn. The situation was a good one, being shady, and the ground covered with small fragments of boulders cast there at some past time from the surrounding fields. It had been undisturbed for years, as the position of the stones testified to; the leaves of many summers had fallen, decayed, and left their remains amongst the interstices in the form of a rich, dark mould.

The surrounding woods, for there are (or were) several in this immediate vicinity, had been thoroughly searched, both by myself and Mr. Armstrong, for many previous years, with a view of collecting specimens of the land mollusca, and had yielded to active and close search examples of *Helix* (*Mesodon*) *albolabris* and *thyroides*, *Zonites arboreas* and *indentatus*, *Helicodiscus lineatus*, *Strobila labyrinthica*, *Vertigo Bollesiana* and *milium*, but never a trace of the *Triodopsis* or *Stenotrema* groups, which, moreover, had never been noticed before by either of us in Long Island. *Stenotrema hirsuta* is at all times a rare shell in this part of the country. I know but of one specimen, collected at Highbridge, N. Y. City, and have heard of a few specimens being found on Staten Island by the late Dr. Hibbard, on the palisades of New Jersey. I have found them, but even there they are exceedingly scarce.

Now in this particular locality they abounded, and a very large quantity of specimens was procured.

The question arises how or by what means were they introduced. Evidently they were not the survivors of a species that had once flourished there, as in that case at least dead shells would have

been found elsewhere near the locality. The large quantities found would point to their having been native to the place for a long period of time. Why they had not spread is not strange when their habits are considered: they are slow in movement and retiring, loving to adhere to the under side of a stone, where moisture can be procured in the hot days of summer. Surrounded by conditions favorable to their existence, they neither seek nor require change of locality.

It is easy to account for the introduction in any place of a new plant or insect. The influence of the wind will scatter spores or seed vessels over a vast area; whilst when the locomotive powers of insects are considered, both aerial and terrestrial, it needs but a new condition, generally the scarcity of food, to cause an immediate migration, bounded only by arrival at the nearest spot indicated by instinct as the place where more suitable conditions exist, necessary to the preserval of life and development. But in the case of a snail, and especially such a slow moving one as *S. hirsuta*, it is different; to such an organism transition over an extended distance would be an impossibility, that is to say, by its own natural powers.

The only theory possible to solve this question is that they were carried there either as snails or the spawn of snails by some outside influence which we can only attribute to a winged animal capable of covering an extended distance continuously; for example, a hawk or other bird of strong flight may have left the Palisades of the Hudson river with dirt adhering to its claws containing the embryo "hirsuta," and winging its way across river and land, alighted on a tree at this spot, and in the process of perching, scraped off dirt and snail spawn, which dropped amongst the stones below. And again, the bird may have swallowed the *S. hirsuta*, and as it is a globular shell and of very hard substance, it may have escaped the grinding of the stones in the œsophagus, passed through the digestive organs, and been ejected at the locality with other excrement, and there perpetuated the species.

At any rate, this appears the only agency by which the species can have been introduced, and unless the same can be distinctly refuted, it forms a theory illustrated by the present example of the diffusion of certain forms of molluscan life over a continent—an agency probably uncommon and rarely put in force by the strange workings of Mother Nature.

N. B.—This locality has been recently invaded by civilization in the form of an electric road passing near it, bringing its attendant blessings (?), houses and their inhabitants. But as yet the colony exists; I collected specimens there as lately as last September.

EASTPORT NOTES.

BY REV. HENRY W. WINKLEY.

Chiton marmoreus Fab.

A variety differing from the type in size and color occurs at Eastport. The type occurs in size as long as 1¼ inches, and even a trifle more than that. The blue variety is not over an inch, the average being about ¾ of an inch. The type has the color of the interior white at the edges of the valves, deepening to rose color. In the variety, which may be called var. *cæruleus*, the rose color gives place to a delicate light blue. The outside is robin's egg blue. Though not common, this variety seems to be established. I have found it twice, and in small numbers.

Bucinum undatum Linn.

The type is abundant at Eastport. Largest specimen, 2⅞ inches. (I have a specimen from near Old Orchard 4 inches long.) A variety (v. *plana*) occurs at Eastport and Grand Manan; size of largest specimen, 1⅞ inches, resembling the type except in size and loss of waves. In some cases the waves remain in faint form; in some cases they are absent altogether. The type form at Eastport has the waves very heavy.

Margarita undulata Say.

Type is abundant; an albino form occurs rarely; it is about one-half the size of the type.

Terebratulina septemtrionalis (young), *Menestho albula* and a few of the deep water starfishes were found at low tide in small numbers.

Astarte crebricostata—formerly common in 10 fathoms, could not be found.

The season has been a good one for collecting at Eastport. Some of the rare forms, like *Lunatia grœnlandica* and *Bela Pingelii*, were found at 15 fathoms, and on the whole, there was a tendency among the deep water forms to the shallower water.

THE HABITS OF FLORIDA LITTORAL MOLLUSKS.

BY JOSEPH WILLCOX.

Although the following facts may be well known to some Conchologists, there are many undoubtedly who have not had the opportunity of observing the habits of southern shells. It is a very interesting scene to witness the actions of many mollusks in the shoal waters in the bays of Florida, and on the sand flats that are exposed to the air at low tide. Below is a list of some of the shells that are found above the water level at low tide on the southwest coast of Florida:

Fulgur perversum,
F. pyrum,
Oysters,
Oliva literata,
Fasciolaria gigantea,
F. tulipa,
F. distans,
Cerithium atratum,
C. nigricans,
C. muscarum,
Cerithidea scalariformis,
Lucina Floridana.
Aplysia,
Sigaretus perspectivus,
Callista gigantea,
Nassa vibex,
Marginella apicina,
Melongena corona,
Conus proteus,
C. Floridanus,
Cardium isocardia,
Cardium magnum,
C. muricatum,

Aplysias do not remain voluntarily out of water at low tide, as they then become dry on the surface and appear to suffer for want of water, often emitting in such cases a large amount of purple fluid. They possess no power of locomotion on land.

The Cerithium usually crawl about on the sand soon after the water has receded, and remain above the surface until the return of

the tide. Their tracks may often be traced more than twenty feet.

Cerithidea scalariformis habitually crawls up the stems of grass, and lives the greater portion of the time out of water.

The *Cerithium nigricans* live in large colonies between high and low water marks.

Cardium isocardia crawls out of the sand soon after the water disappears; but they do not travel far. When put in a basin of salt water, they often close their shells with a lively snap.

Fasciolaria distans is the only shell, observed by the writer, which feeds upon the *Vermetus nigricans* colonies, into the tubes of which it inserts a long proboscis.

Fasciolaria tulipa is the only shell, in the knowledge of the writer, which makes an effort for freedom when held in the hand. It projects its body out of the shell and "slashes" about its long and sharp operculum with sufficient force to occasionally bring into view some of the blood of its captors.

The *Oliva literata* often lives in colonies. It emerges from the sand soon after the disappearance of the water, and crawls for a considerable distance.

Sigaretus lives usually under the sand, but at low tide it often comes to the surface; but it does not proceed far. It is a favorite morsel for the "littoral pigs," who root it out of the sand with avidity.

Lucina jamaicensis affects the muddy sand. They lie deeply buried under the surface, and seldom are seen on top of the mud. The *Lucina tigrina* probably possesses the same habit, as many dead shells are found in places where few are seen living.

The *Pholas costata*, I presume, lives below low water mark, as their shells are washed ashore in some places in great quantities. They also live in colonies in the muddy sand flats that are dry at low tide.

The shell reposes about 10 to 12 inches below the surface, but the animal can project its long siphon to the surface, through a hole permanently kept open.

In a future article we propose giving the results of observations upon the feeding habits of some Florida mollusks.

NEW FORMS OF WESTERN HELICES.

BY HENRY A. PILSBRY.

The Pacific Slope has been proven by the researches of many collectors to be richer in varietal forms of Helices than any other part of the United States; but although there are a large number of well-marked local varieties, there has been a tendancy to over-split them on differences of no racial value. The following forms are believed to be sufficiently individualised to require names.

Although superficially some species such as *arrosa*, *tudiculata* etc. are very much like the European group *Arionta*, others like *Campylæa*, and still others from Lower California are like *Euparypha*, it is the writers belief that the American forms are not closely allied to these European groups, but rather to the forms found in Japan, China and the Philippines, the resemblance to European types being a case of "convergence" of one character, the shell, and not extending to the less readily modified viscera. Other allies of the Californian group are the *Hemitrochus* of Florida and the greater Antilles. In Mexico another allied group, *Lysinoe*, is found; but the genuine Californian type extends southward along the mountain axis as far as the Argentine Republic. All these American, and the East Asiatic groups are more nearly allied to each other than any of them are to the European Helices.

The earliest name for this group of forms is the rather cumbersome term *Epiphragmophora* of Döring; and it is proposed to use this in a generic sense, to supercede *Arionta*, *Aglaia* and *Euparypha* of American writers. The history of all these snails and their names, with a discussion of their probable ancestry and migrations, will be found in the writer's Guide to Helices, now in press.

Epiphragmophora ellipsostoma n. sp.

Shell globose-depressed, with low-convex spire, round periphery and almost covered umbilicus; thin; color a greenish straw tint, with one supra-peripheral brown band, surface shining, showing irregular growth wrinkles, and closely, somewhat spirally wrinkle-malleate all over, much as in the thin forms of *E. tudiculata;* the spiral tendency of the wrinkles more marked below. Whorls 4, the apical 1½ forming a rather large nuclear shell; last whorl deeply descending in front, a little constricted behind the basal lip. Aperture very oblique, short-elliptical, obliquely truncated by the penultimate whorl; peristome rather narrowly but evenly and well reflexed

throughout, dilated at the columella insertion and almost covering the umbilicus. Alt. 12·5, greater diam. 20, lesser 16·2 mm.

Belongs to the *E. rowelli* group, but differs from other species in its malleation. From *tudiculata* and its allies, it differs widely in the elliptical mouth, coarse apex and fewer whorls. The same characters and its sculpture remove this shell from *E. traskii* and its several varieties described by Hemphill.

Locality, "San Juan del Norte" (Gabb). Probably on the east coast of Lower California.

NOTES AND NEWS.

Variations of Pleurocera alveare Conrad.—In L. and F.-W. Shells, part 4, (*Strepomatidæ*), page 50, Mr. Tryon says: "The species is very variable in length," leading one to infer that the other features were more constant. Such is not the case.

Specimens from Cypress and Shoal creeks, Ala., present such a difference that on first sight the mature shells of one stream would not be taken for the same species as those from the other.

From Cypress creek they have the folds or tubercles on each whorl and the striæ on the base well defined. From Shoal creek they are eroded on the spire, giving the shell a cylindrical appearance; body whorl smooth and the striæ of the base faint or wanting; a number from both streams are two-banded; the upper band causes the dark spots Mr. Lea mentions in his description of *pernodosa*. In both streams they were found on rocks in the current.—*A. A. Hinkley, Dubois, Ill.*

New Locality for Unio Ellipsis Lea.—While collecting in the vicinity of Florence, Alabama, the past summer, eight specimens of this species were found in the Tennessee river.—*A. A. Hinkley.*

Mr. Edw. W. Roper, of Revere, Mass., gave his friends in Philadelphia and Washington a short but pleasant call recently.

Z. cellarius in Western Pennsylvania.—I found 3 specimens of *Zonites cellarius* Müll., 2 living and 1 dead, from the Phipps Conservatory in Allegheny City, and as the 3 specimens came from 3 different greenhouses, they must have obtained a pretty good foothold. None of the shells were fully mature, the dead one being the largest.—*Geo. H. Clapp.*

The Rate of Growth of Helices.—I have placed mature *Helix appressa* in a box the middle of May. They have laid eggs,

the eggs have hatched, and the animal has grown to maturity by the first of November. With *Helix alternata* the growth was much less, hardly making more than one-half that of *H. appressa.*—*Chas. S. Hodgson, Albion, Ill.*

ARGONAUTA ARGO on the East Florida coast.—A specimen of this species measuring 7⅜ inches diameter, and perfect in every respect, has been obtained by Mr. Wm. P. Stanley. It was found about 10 miles below Palm Beach, and contained the animal when cast ashore.

RECENT PUBLICATIONS.

OBRAS MALACOLOGICAS DE J. G. HIDALGO. Madrid, 1894. The name of JOAQUIN GONZALEZ HIDALGO has long been a familiar one to conchologists acquainted with recent French and Spanish literature of mollusca; and whoever has used the more extended works "*Moluscos Marinos de Espana, Portugal y las Baleares*" and the "*Moluscos Terrestres*,"—works indispensable in the study of the shells of Southwestern Europe—will hear with pleasure of the publication of the "*Obras Malacologicas.*" This *magnum opus*, of which several parts lie before us, will consist of three portions: works relating to the fauna of Spain, works upon the South American fauna and publications on the land shells of the Philippine Islands. Of the former two we may judge in advance by the magnificently illustrated volumes named above, and the "*Moluscos del Viaje al Pacifico.*"

That upon the Philippine fauna, now in course of publication, aims to present a summary of the literature of each species, with valuable critical notes on the variations, distribution, etc.; and it is illustrated on a scale which leaves little to be desired. The land snails of the Philippines are among the most beautiful of any region, and it is only fair to say that for the first time justice is done them in the splendid plates of Hidalgo's *Obras.* The Helices and Cochlostylas are illustrated in the parts already issued, and we hope to have the Bulimi and operculates before long. The text is characterized by its moderate and conservative spirit, refreshingly free from "nouvelle ecole" vagaries, but well abreast of the times.

The work will doubtless be of the greatest assistance to all students of this rich fauna, and we hope that its talented and industrious author may succeed in bringing it to a good completion.

List of Texas Mollusca collected by J. D. Mitchell. This catalogue embraces both marine and fresh-water forms, and adds many localities to the published records of Texas shells.

Notes on Some Marine Invertebrata from the Coast of British Columbia, by J. F. Whiteaves. A new Pecten, *P. (Pseudamusium) vancouverensis* is described and figured, and an adult specimen of *Turcicula cidaris* is for the first time illustrated.

A Contribution to a Knowledge of Indiana Mollusca, by R. Ellsworth Call (from Proc. Ind. Acad. Sci., III). The present paper is a preliminary list of the Indiana mollusk fauna, showing what has already been done toward an exact knowledge of the conchology of that State. Only authentic locality references are given, and nothing is admitted to the list on the strength of its occurrence in neighboring States. Of land shells, 58 species are enumerated; fresh-water univalves, 47 species; bivalves, 102 species. No less than 53 species were originally described from Indiana localities. A bibliography is given, both of special and general works bearing on Indiana shells. The "Contribution" is a step in the right direction, and will be welcomed by both Indiana collectors and those interested in the distribution of United States shells generally.

Notes on the Miocene and Pliocene of Gay Head, Martha's Vineyard, Mass., etc., by W. H. Dall (Amer. Jour. Sci., Oct., 1894). The result of Dall's visit to this locality, examined by Lyell 50 years ago, and by numerous other geologists later, are important, verifying its reference to Miocene, in which it corresponds to the Chesapeake, "in all probability to the upper part of the Chesapeake, certainly not lower than the St. Mary's fauna, and probably between that and the Yorktown beds." At about 80 feet above sea level a small patch of shell fragments was found, in a stratum of sand, which is considered Pliocene. *Nucula shaleri* and *Macoma lyelli* are described as new from the Miocene; and *Chrysodomus stonei* Pilsbry, originally described from stray specimens washed ashore on the New Jersey coast, was found, thus fixing its position, hitherto unknown, in the Miocene.

THE NAUTILUS.

VOL. VIII. DECEMBER, 1894. No. 8

A SHELL HUNT FORTY FEET UNDER THE SEA.

BY C. HEDLEY, SYDNEY, AUSTRALIA.

To widen the fairway of Port Jackson (Australia), a submarine reef is being removed. An opportunity of going down with the divers employed thereon was kindly offered to myself and a scientific friend by the officer in charge of the operations. So tempting an invitation was, of course, accepted with delight. Often in imagination had we wandered on the ocean floor, peering into ghastly wrecks of ships sunk long ago, fighting with some huge shark or monstrous octopus, and gathering treasures of science or heaps of gold. Now our dreams were to come true and we were indeed to tread that fairy-land. We might not have the luck of the mariner in the song who

> "Fell overboard in a gale,
> And found down below where the seaweeds grow,
> Such a lovely maid with a tail,"

but we should certainly pluck strange growths at the bottom of the sea as one might pick flowers in a meadow.

A trim launch sped with us from Circular Quay down the famous Sydney Harbor, past bay after bay, some lined with wharves and shipping and some with trees growing to the water's edge, by rocks and white sandy beaches, past point and headland gay with villas and gardens, or sombre with eucalypt forest. So familiar was the

scene to us, that we smoked and chatted, unmindful of its beauties, till we reached a flotilla of punts and barges moored near the Heads.

After a cup of tea with the overseer, we prepared for our descent by divesting ourselves of boots, coat, vest and collar. A couple of laborers officiated as my *valets de chambre*, wrapping me first in thick flannel socks, trousers and jacket, and then in a canvas over-all garment which left only the head and hands uncovered. The hands being left bare, the sleeves were secured at the wrists by rubber cuffs and bracelets. My feet were thrust into a pair of enormous boots, each sole of which was weighted with 25 pounds of lead. Bending my head, two men placed over it a huge diver's helmet and screwed it into a brass collar of the canvas dress. My costume completed by slinging on chest and back two large metal weights, I was told to rise. Thus encumbered, it was no slight exertion to get up, take three steps to the ladder, and descend into the water knee-deep. There I halted while my signal cord was belted round my waist; my air-tube, which reminded me of a garden hose, was screwed to my helmet and the pump commenced to force air through it. Finally an attendant screwed a plate-glass front, the size of a saucer, into my helmet; from the inside, this last operation resembled the closing of a coffin-lid. Some one tapped my helmet twice, the submarine signal for "all's well," and I started.

Stepping off the bottom rung of the short ladder, down I went, till the keel of the barge loomed up, rose and passed me—down, down into the green sea water, watching the silvery bubbles stream upward—down, down, down, as the water darkened. That sensation of gliding down into an emerald abyss, was the weirdest, dreamiest thing I ever felt. Then so gently did I alight, that I merely noticed that I had ceased to fall. At my feet I saw rock and sand and seaweed; looking up, I saw a monster in a helmet with two ropes leading away up to where the sky ought to be. The monster's face showed through his little window as a big, fair moustache and a pair of kindly blue eyes. Fetching out of a capacious trouser pocket a small school slate, he wrote, "How do you feel? Shall we go on?" and held it up. Taking his slate, I wrote, First rate; go on." He read the message, gravely rubbed the slate clean with his finger, pocketed it, and held out his hand. I grasped it and we started for a walk at the bottom of the sea.

Then I noticed a pain in my ears; the compressed air was hurting me. To cure it, I went through the motion of swallowing once

or twice. Feeling more comfortable, I "began to take notice," as they say of the babies. The light was bright enough to see small things plainly twenty feet away, but the water strangely magnified familiar objects. A shoal of little fish passed us, swimming under our arms and between our legs in the most ridiculous way. I tried to take one with my hand, but it deftly turned and avoided my grasp. The guide, seeing my attempt, pinned one to the ground with an iron rod he carried, and handed it to me; another he stabbed and caught as it swam by. Before we had gone far I had lost all sense of time, space or direction, and became too confused to know whether I had travelled east or west, ten yards or a hundred, in ten minutes or half an hour. A queer sensation was that of having escaped from the law of gravity; it seemed just as easy to walk up as down a cliff—we usually walked on our toes, sloping from the ground at an angle of forty to sixty degrees. When too much air is pumped down, the submarine pedestrian is unduly buoyant, and his aims to clutch a shell from the ground must be comically like the dodging and staggering of a drunken man.

A little dell lay before us choked with rank seaweed, through which we strode waist-deep like plunging into a tangle of fern in some damp valley on the land. My guide reached out, picked something off a broad frond, and handed it to me. It was a *Doris*, a lovely creature, whose like I never saw in books, striped with purple on a milk-white ground. It began to crawl over my fingers quite unconcernedly. I clapped my hands and tried dumbly to express my delight by patting my companion's big fist. He replied by offering me the slate, on which I wrote, "Very good; put him in the bottle." Rubbing out my words, he wrote, "Send down the bottle," tied the slate to the rope and jerked the latter four times. Away went rope and slate to the regions above. In response to an answering signal, the slack was hauled in and my collecting-jar descended tied to the rope. In turn, we tried in vain to open it. Although our correspondent above had filled the bottle with water, the pressure at our depth so sealed it that we could not raise the stopper. With a message on the slate, "Open this bottle and send it down open," we sent the jar aloft. When is was lowered to us the second time, I found that my *Doris* had slipped unobserved through my fingers, and so I lost a possible new species, the rarest treasure I was to see that day.

Continuing our travels in the dim water-world, we passed through a field of sponges. Not the brown, round masses of the bath-room, but radiant growths of scarlet (*Raphyrus hixoni* and *Halicondria rubra*) and purple, here and there great open oscula, tempting one to poke in a mischievous finger. Some grew in tufts like moss, some expanded like a dainty vase (*Phyllosiphonia caliciformis*), some forked like branches of trees and some spread like a lady's fan. One abundant species, about the size and shape of an orange, was pure ice-white, studded with golden dots that almost glittered (*Leucondra* sp.). Of all these we gathered what we could, pricking our hands sore with sponge spicules as we worked. When, on the morrow, our ravished beauties lay dead on a table in the museum, they had faded sadly from their pristine splendor. Among the sponges grew purple *Boltenia pachydermatina*, a pear-shaped head upon a slender stalk, like tulips in an earthly garden.

For a surprise, the diver held up before my face and pressed an Aplysia. From it flowed a violet stream which stained the water for two feet around, hiding hand and mollusk in the cloud. One of my last captures was an exquisite nudibranch, which swarmed on the broad fucus blades. In hue it was the blue of a summer sky, flecked with blood-red dots and stripes. I had now grown weary; not of searching for wonders, but of supporting the heavy diving armor, and was content to be drawn up again to the world of air and sunshine, which I had quitted three-quarters of an hour before.

On reflection, I found the reward of my under-water foray to be, not a hoard of specimens, but a better appreciation of the circumstances under which marine life exists. Our party of four had only observed, dead or alive, *Chamostrea albida*, *Vola fumata*, *Trigonia lamarcki*, *Struthiolaria scutulata*, *Drillia oweni*, *Cassis pyrum*, *Cypræa xanthodon*, *Astralium tentoriforme*, *Ranella leucostoma*, *Aplysia keraudreni*, *Chromodoris bennetti*, and two undetermined *Doris*. Molluscan life seemed, on the spot I explored, to be less plentiful than at low-tide mark. Perhaps, however, the difficulties under which I labored as a beginner in the art of diving, impeded me from finding what was really there. After seeing the rough sea floor, one wonders that a dredge should capture as much as it does. A rich harvest probably awaits a conchologist who should seriously practice diving as a means of collecting.

VERTIGO MORSEI, n. sp.

BY DR. V. STERKI.

Shell large (for the group), cylindrical-turriculate, with a rather acute apex, imperforate rimate, with few obsolete striae of growth, shining, translucent; whorls six, rather slowly and regularly increasing, the last scarcely higher than the penultimate and rather narrower, somewhat sloping towards the base, slightly ascending at the aperture; suture deep; aperture lateral, scarcely oblique, comparatively small, inferior and palatal part well-rounded, the latter with an angular impression and slightly protracted in about its middle, the upper half more strongly curved, peristome everted; on the palatal wall, at some distance from and parallel with the margin, a moderate crest, behind it a deep and large impression over the palatal folds, and in front of it a groove corresponding with the impression at the auricle; inside the crest there is a distinct callus of the same color as the shell; apertural lamellae and folds typically nine: three on the parietal wall (the same as in *V. ovata*), the largest whitish; two on the columella, the superior strong, vertical above, then in an angle turning horizontally, the inferior horizontal, lamelliform, thin, high and directed obliquely upward; basal small, sometimes double, rarely 0; palatals high, and rather long, curved and directed upward; suprapalatal small, nodule-like.

Size: alt. 2·7, diam. 1·3; apert. alt. 0·9, lat 0·8 mill.

Soft parts not examined.

Habitat: Kent County, Michigan.

This magnificent Vertigo has been collected by Dr. DeCamp and kindly sent for examination by Mr. Bryant Walker. There were seven specimens, all fully mature, well-formed and almost exactly alike. Yet there are some slight differences, as they may be found in all forms of this group: in one example the inferior parietal tooth is wanting, in another the basal only trace-like, and in a third the same is double, as frequently found in *V. ovata*. With the latter species, *V. morsei* has much resemblance, especially in the aperture: the configuration and the "teeth" are the same, but the inferior columellar, and the two principal parietals, are rather larger, and markedly directed upward. The main difference is in the number and relative size of the whorls: while in *V. ovata* they are five, and rapidly increasing, the last predominating; in our species there are six, slowly increasing, the last, and consequently the aperture, com-

paratively small. This is a radical difference, and gives the shell quite another aspect, so that there can be no question about its being distinct. But *V. morsei* is also decidedly larger, *V. ovata* not, or little, exceeding two millimers of altitude.

The species is named in honor of Mr. E. S. Morse, who has so considerably promoted our knowledge of the Pupidae.

New Philadelphia, Ohio, Nov., 1894.

A NEW CHITON FROM CALIFORNIA.

BY W. H. DALL.

Genus Lepidopleurus Risso.

Section *Lepidopleurus* ss. Valves adjacent, jugal area obscure, not separated from the pleural tracts; lateral areas distinct, or feeble, when all the sculpture is feeble. Type *L. cajetanus* Poli. Mediterranean.

Section *Oldroydia.* Valves separated by narrow extensions of the girdle, reaching to the jugum; jugal area prominent, sculptured differently from the pleural tracts and extending in front of them between the sutural laminæ; lateral areas not differentiated; valves heavy, strongly sculptured. Type *L.* (*O.*) *percrassus* n. sp.

Lepidopleurus percrassus n. sp.

Shell solid, strong, small, of a pale pinkish-brown with a darker brownish girdle which appears rather narrow in the dry state; scales very minute, partly dehiscent, chaffy, with occasional slender spinules resembling hairs; scales on the base crowded, minute, sandy; an extension of the girdle is prolonged between the valves on each side as far the jugum, the surface of these sinuses is also minutely scaly with occasional spinules; valves thick, white below, moderately arched with the prominent jugum forming a sort of keel; near the points of insertion the valves are heavily callous below; the sutural laminæ are short, smooth and separated at the median sinus by a prolongation of the jugum in advance of the anterior margins of the pleuræ; sculpture of the jugum consisting of punctate fore-and-aft parallel grooves with some small elevated transverse ridges anteriorly; the rest of the valve has, on each side, six or eight vermicular ridges divaricating toward the posterior edge of the valve and irregularly corrugated with sharp, fine, elevated

lamellæ crossing the interspaces transversely but fading out on the ridges; head-valve with minutely nodulous concentric ridges; tail-valve highest at the subcentral, not very prominent mucro, in front sculptured like the intermediate valves, behind the mucro like the head-valve. Length about 14, width 5·75, height 2·5 mm., in the dry state. The dry girdle about half a millimeter wide.

Specimens obtained by Mr. T. S. Oldroyd from a stone pulled up from about 75 fathoms in the Santa Barbara Channel off San Pedro, California.

This species, for which a section named in honor of Mr. Oldroyd is proposed, is very remarkable. The girdle recalls that of *Deshayesiella* Carpenter, but is extended in such a manner as to partly separate the shelly portions of the valves. The very callous surfaces of the interior, according to Mr. Pilsbry, are unique in the group. Most of the species of *Lepidopleurus* are comparatively thin, and though *L. cajetanus* is a solid shell, none of the species are as heavy as the present one in proportion to their size. The conspicuous and forwardly produced jugum is unique in the family. The type is in the National Museum, and will be figured later.

PATELLA (HELCIONISCUS) NIGRISQUAMATA REEVE.

BY CHAS. T. SIMPSON.

In the collection of the National Museum are twenty specimens of *Patella* bearing the above name received from Frederick Stearns, the U. S. Exploring Expedition, W. K. Fischer, and the Lea-Chamberlain Collection—the latter credited to "Dr. R." by Mr. Lea, and probably from Ruschenberger. One other specimen of the same name is in the museum from the Rich Collection without locality.

These vary from young shells less than an inch in diameter to those which are more than 3½ inches in length. There can be no doubt that the above name is correct, as all the specimens agree fairly well with Reeves' description and excellent figures in the Conchologia Iconica (Vol. VIII, Patella, species 3, plate II, figs. 3ª and 3ᵇ).

The species described as *P. boninensis* in the NAUTILUS (Nov., 1891, p. 79), was characterized by its author as having a large central muscular callus, and two diverging dark bands from the anterior head segment.

Our large series shows every possible variation in the development of these characters, from young specimens in which no scar or tails (for they look very much like squirrel tails) are visible, to old, solid shells with a heavy, snowy, swollen callus, and having these brown wings very strongly developed.

The same characters are seen in *Patella* (*Helcioniscus*) *argentata* Sowb., better known as *P. talcosa* Gld. *H. clypeater*, which Mr. Pilsbry places with *Nacella*, on account of slight differences in anatomical characters, but which, conchologically, seems closely allied to *P. argentata*, and in other species.

In short, there can be no doubt that this scar and the curious radiating brown lines are merely adult characters which are developed in quite a number of species. I quite agree with Mr. Geo. W. Taylor in believing that this species does not come from the west coast of South America, but is probably confined to the north-western part of the Indo-Pacific region.

THE VIRGINIA COLONY OF HELIX NEMORALIS.

BY T. D. A. COCKERELL, N. M. AGR. EXP. STA.

There appeared in the NAUTILUS, of Nov., 1889, a paper under the above title, setting forth some very interesting facts regarding the variations exhibited by a colony of *H. nemoralis* at Lexington, Va. Prof. J. H. Morrison, who collected the shells studied, took considerable interest in the matter at that time, and had gathered together a good deal of information additional to that given in the above-cited paper. I have, therefore, been quite disappointed not to see any publication by him on this subject, or any evidence that the colony has received further attention.

It is scarcely necessary to dwell on the extreme interest attaching to the history of this colony. Here we have a variable species introduced into a new country, and varying in a most extraordinary manner under the influence of the new environment. The peculiar variations are very numerous, though, in the main, tending entirely in one direction—to the splitting of the normal bands. Although the number of individuals thus varying is considerable, very few of such have exactly the same formula, whereas, several of the old European variations occur in numerous specimens.

It appears, in the highest degree, probable that these peculiar variations are congenital and not acquired during the lifetime of

the individual,[1] in which case we have an example of environment modifying the germ-plasm—the odds against the variation being only accidentally coincident with the changed environment being enormous.

In 1889, the above-mentioned changes had taken place in the colony, but time was needed to show whether they would increase in number and degree; or whether, as seemed more probable, the old European varieties would eventually assert themselves, and swamp the rest. In either case, the result would be very interesting, and now that five years have elapsed, it is extremely desirable that some one should make a new investigation and report in detail. It is really astonishing that no one has yet done so. The colony was, in 1889, so evidently in a condition of unstable equilibrium, that it seems certain that changes must have occurred in the interval, tending to the predominance either of the old or the new (split-band) type.

Believing that Prof. Morrison would publish, I did not follow my paper of 1889 with further observations, but it will be as well now to put the following on record:

(1) Lexington, Va., received from Morrison one of each of the following, Oct. 26, 1889:

Helix nemoralis mut. *guettardia* Moq.
Helix nemoralis mut. *arcelinia* Loc.
Helix nemoralis mut. *petiveria* 10345 = *requienia* Moq.
Helix nemoralis mut. *libellula* 1(234)5 Kregl.
Helix nemoralis mut. *libellula* $123(_{4}4)5$ nov.
Helix nemoralis mut. *libellula* 0030_{5} Ckll. (juv.).
Helix nemoralis mut. *libellula* $12_{3}45$ Ckll.
Helix nemoralis mut. *libellula* $1_{2}23_{x}(45)$ nov. (juv.).
Helix nemoralis mut. *libellula* $12_{3}3(45)$ nov. (juv.).
(Morrison had another example.)
Helix nemoralis mut. *libellula* $12_{3}3(_{44}4)5$ nov.
(Morrison had another example.)
Helix nemoralis mut. *libellula* $_{1}0_{3}45$ nov. (juv.).
Helix nemoralis mut. *libellula* $12_{x}3_{x}45$ nov. (juv.).
Helix nemoralis mut. *libellula* $_{1}234(5_{5})$ nov. (juv.).
Helix nemoralis mut. *libellula* $123_{3}45$ nov.
Helix nemoralis mut. *libellula* $12_{xx}3_{xx}45$ nov.
Helix nemoralis mut. *libellula* $003_{4}5$ Ckll.

[1] If so acquired, it must be in very early life, as, in many instances, the variations were recorded from immature examples.

Helix nemoralis mut. *libellula* $12_3(45)$ Ckll.

Mr. Morrison also sent me word of the occurrence of mut. *libellula* 0030_5 Ckll.

(2) Lexington, Va., received from Morrison in November, 1889.

H. nemoralis mut. *libellula bimarginata* 12_x345 nov.
(the bands tend to coalesce.)

H. nemoralis mut. *libellula* 12345 Moq.

H. nemoralis mut. *libellula bimarginata major* 00000 Moq.
(thin, max. diam. 28½ mm.)

H. nemoralis mut. *libellula major* 12345 Moq.
(max. diam. 26¾ mm.)

H. nemoralis mut. *petiveria* (12345) = *richardia* Moq.

H. nemoralis mut. *petiveria umbilicata* 123_x45 Ckll.
(nov. mut. *umbilicata*, shell more globose, umbilicus open.)

H. nemoralis mut. *libellula* 1234445, nov. = *morrisonia* nov.
(extra bands 44, much thinner than 4.)

H. nemoralis mut. *albescens* 00000 Moq.
(pale yellow, like mut. *subalbida* of *hortensis*.)

(3) Lexington, Va., not seen, recorded by Morrison in litt., Nov. 16, 1889.

H. nemoralis mut. *libellula* (12)(345) Kregl. (one).

H. nemoralis mut. *libellula* 120(45) Kregl. (one).

H. nemoralis mut. *libellula* 1_2045 nov. Morr. (two).

H. nemoralis mut. *libellula* (123)45 = *nilssonia* Moq. (one).

H. nemoralis mut. *libellula* 1234455 nov. Morr. (one).

H. nemoralis mut. *rubella* 123(45) Moq. (four).

H. nemoralis mut. *rubella* 10345 Moq. (three).

H. nemoralis mut. *rubella* 123X45 Ckll. (one).

(4) Lexington, Va., not seen, recorded by Morrison in litt. Jan. 2, 1890. This is the most extraordinary series of all; about all the band-variations are new.

Mut. *petiveria* $12_{3xx}45$.

Mut. *petiveria* (12)3(45) Moq.

Mut. *libellula* $1_{23}45$.

Mut. *libellula* $12_x3_{xx}45$.

Mut. *libellula* $12(_33)_x(45)$.

Mut. *libellula* 123(45) *bimarginata*.

Mut. *libellula* 123_x45 Ckll.

Mut. *libellula* $123_{xx}45$.

Mut. *libellula* $123_{xx}(45)$.

Mut. *libellula* 1(22)045.

Mut. *libellula* 1234(55).

Mut. *libellula* 12(33)45.

Mut. *libellula* $1_23_x4_4(55)$.

Mut. *libellula* $12_23_34(55)$.

Mut. *libellula* 1(22)3(45).

Mut. *libellula* $123_4(4445)$.

Mut. *libellula* $1(2_2)345$.

Mut. *libellula* $(_112_23_{34}4_4555)$.

Mut. *libellula* 123_445.

Mut. *libellula roseolabiata bimarginata* 12345.
Mut. *libellula* 123(4$_4$)5.
Mut. *libellula* 123($_{44}$4)5.
Mut. *libellula* 12$_x$345 Ckll., *bimarginata.*
Mut. *libellula* 12$_x$345 Ckll.
Mut. *libellula* 12$_{33}$(4445).
Mut. *libellula* ($_1$2$_{xx}$3$_3$)(45).
Mut. *libellula* 103(44)5.
Mut. *libellula* 123(44)5.
Mut. *libellula* 1234$_4$5.
Mut. *libellula* 1(22)345.
Mut. *libellula* 1$_x$03$_x$45.
Mut. *libellula roseolabiata bimarginata* ($_1$2345).
Mut. *libellula* 1$_2$3$_4$45.
Mut. *libellula* (12$_{333}$45).
Mut. *libellula* (12$_{233}$45).

It should be explained that a split-band bracketed, as (44), means that it is split, but joins near the mouth of the shell.

NOTES AND NEWS.

Mr. T. Wayland Vaughan is now engaged in geological work on the scientific corps of the U. S. Geological Survey.

Mr. Gilbert D. Harris, formerly of the U. S. Geological Survey, has, after spending the summer abroad, taken up the work of his new appointment at Cornell University, where the valuable collection of mollusks, of which Dr. Newcomb was so long curator, is under his charge, as well as the Palæontological Department.

The Long Beach (California) Conchological Club elected the following officers for the next year: Miss I. M. Shepard, President; Mrs. M. Darling, Vice-President; Mrs. Terry, Treasurer and Secretary, with Miss E. Lowe her assistant.

The Club is to hold its meetings twice a month. The following are the charter members: Miss E. Lowe, Mrs. M. Darling, Mrs. E. Cushman, Mrs. R. Preston, Mrs. Terry, Mrs. Craig, Miss I. M. Shepard and Mrs. Dial. At the next meeting, to be held December 1, new members will be received. The Club has been studying and collecting for a year, but had not before formally organized.

They held their first Annual Meeting and Reception at the home of Miss E. Lowe, on the evening of October 6. A short program was given and letters of greeting read from Dr. W. H. Dall, Mr. H. Hemphill and Prof. Josiah Keep. Ice cream and cake were served in shells, and the rooms handsomely decorated with palms, shells, kelp, and smilax.

The Club would be glad to hear from any and all interested in the same study, and will make a special study and collection of our local shells or shells of Los Angeles Co.

Amnicola olivacea Pils.—In April, I visited the original lo-

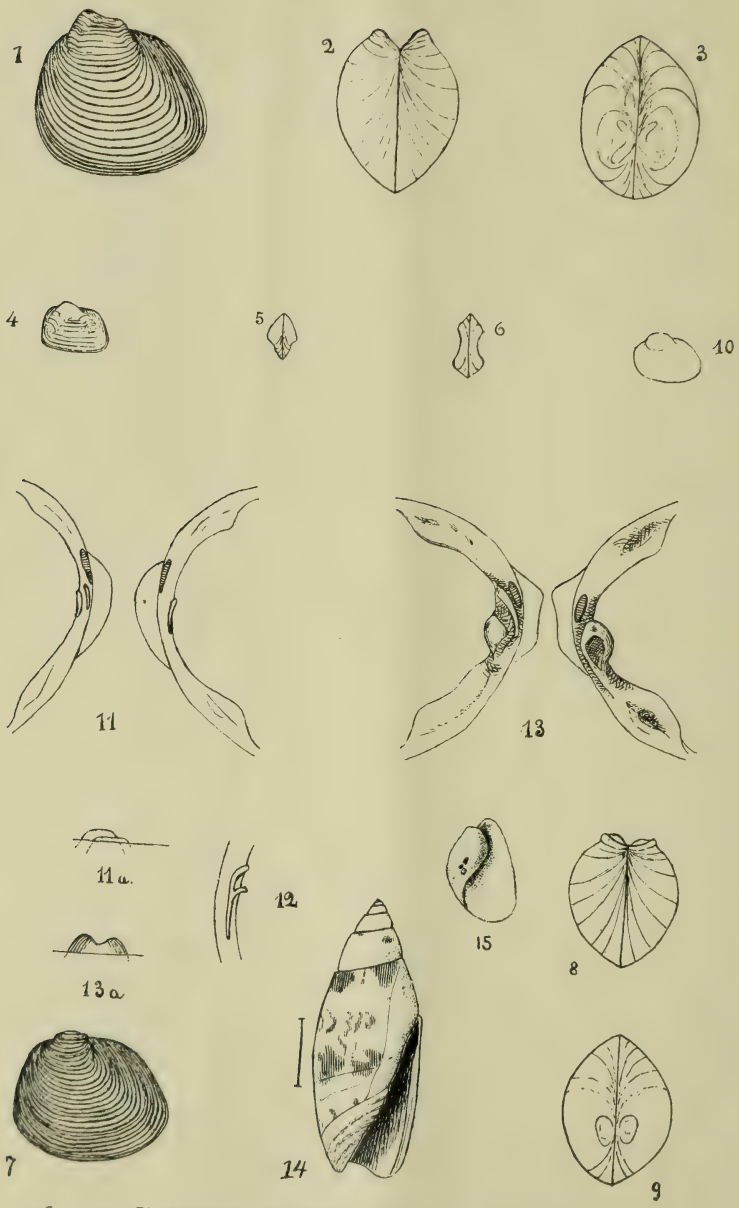
cality (Huntsville, Ala.) and was surprised to find this species in vast numbers. The stream has a mud bottom which is much indented with cow tracks. In these the Amnicola had congregated—not as a layer on the surface, but as a solid mass. To get an idea of how many there were I scooped up the contents of three holes, and after washing them thoroughly, found I had a full quart of the living animals. There must have been bushels of them in the few rods of stream which I inspected. The stream receives some of the city sewerage, so it is probably a good feeding-ground.

The geese which infest the neighborhood do not seem to care for this species.—H. E. SARGENT, *in lit.*

NEW PUBLICATIONS.

THE LIFE AND WRITINGS OF CONSTANTINE SAMUEL RAFINESQUE, by Richard Ellsworth Call, is announced to be published in January next. The volume will be in quarto form, and issued in paper only. It will contain several full-page illustrations, one of which will be a portrait of its subject. A complete bibliography of the writings of Rafinesque, on every subject, comprising over four hundred titles, will be included, together with a certified copy of his will, one of the most remarkable testamentary documents ever probated. It will prove of exceptional value to those interested in botanical, conchological, or ichthyological matters.

A MONOGRAPH OF THE LAND AND FRESHWATER MOLLUSCA OF THE BRITISH ISLES, by J. W. Taylor, F. L. S., is announced as in press. The object in issuing this work is to bring together, as far as practicable, all reliable information bearing upon the study of the British Land and Freshwater Mollusca. It will aim to combine the information upon all aspects of the study, and thus form a standard work of reference as well as a reliable text-book upon British Land and Freshwater shells. The first volume will be devoted to general characters of the shell, the morphology of the animal, geological and geographical distribution, habits, parasites, etc. The second volume will be devoted to the treatment of species individually, and will aim to give accurate descriptions and faithfully colored figures of the typical shell and the chief varieties of every species; the various organs of the animal will be described and illustrated in the text, and full lists of localities, with a full synonymy will also be given, as well as observations upon the habits and peculiarities of each species. Mr. Taylor's work promises to be a timely and useful one. Fuller notice will be given upon the appearance of the first volume.



1–6, 13, 13a, Pisidium cruciatum Sterki. 7–12, P. punctatum Sterki.
14, Olivella gracilis v. Gaylordi Ford. 15, Haminea virescens Sowb.

THE NAUTILUS.

VOL. VIII. JANUARY, 1895. No. 9

TWO NEW PISIDIA.

BY DR. V. STERKI.

Pl. II, Figs. 1–13.

Pisidium cruciatum, n. sp. Figs. 1–6, 13, 13a.

Shell minute, inequipartite, oblique, subtriangular in outline, high, ventricose, regularly and comparatively coarsely striated, straw colored; anterior part moderately long with an oblique, nearly straight edge above and the end rounded; posterior part short, the end somewhat obliquely truncate, superior margin rather strongly curved, scutum scarcely, scutellum little marked, the latter forming a rather distinct angle; inferior part moderately curved; beaks prominent, each with two ridges diverging at nearly right angles, together forming a cross on the upper aspect of the shell, each of the ridges ending in a nodule of which the posterior is larger and more prominent; nave rather thick, whitish; hinge very stout, list strong; cardinal teeth rather large, and strongly projecting inward from the hinge list; in the right valve one, strongly curved, posterior part thick, anterior thin, lamellar, the ends united by a lamella so as to form a deep groove into which the posterior tooth of the left valve articulates; in the left valve two, the posterior (inferior) stout, massive, the other, superior and a little anterior, rather short, fine, lamellar, oblique, little curved; lateral teeth large, high and pointed in the left, strongly projecting inward in

the right valve, the latter with no (or only traces of) outer teeth, and a deep groove; between the cardinal and the lateral teeth the hinge-list is rather deeply excavated, so that all teeth are markedly isolated; muscle insertions visible; ligament, short, strong.

Size; long 1·9, alt. 1·9, diam. 1·4 mill.

Soft parts slightly yellowish.

Habitat: Tuscarawas River, at New Philadelphia, Ohio.

Figure 1 represents an adult specimen, 2 the posterior, 3 the dorsal aspect, 4–6 a young example, 0·8 mill. long; fig. 13 the hinge; 13a the dorsal aspect of the right cardinal tooth with an indentation; figs. 1–6: scale 15×1.

The singular shape of the umbones is so characteristic that this species will be recognized at once, and cannot be mistaken for any other. And also in the formation of the hinge it is quite unlike any other Pisidum, so that it holds a peculiar position in the genus. In the hinge structure it is very illustrative and instructive for the understanding of the different forms of cardinal teeth; yet this is not the place to discuss the subject at length.

Our species is rather variable, even so that all specimens from one place in the river are different in size and shape from those of another place scarcely half a mile distant. It measures from 1·6 to 2·1 mill. (One specimen 2·1:2·1:1·6, another 1·7:1·7:1·3 mill.), 1·9 being about the average; the margins may be rather obtuse or somewhat acute, the beaks more or less prominent, and the anterior nodule more or less marked. As a rule there are no outer lateral teeth in the right valve, yet traces of them may be seen in some specimens. Also in the formation of the cardinal teeth there is some variation, as the one in the right valve may be indented in its middle, at the angle, and so there are apparently two teeth (fig. 13a).

Pis. cruciatum is not rare in the Tuscarawas River, where, so far, it has only been found, but probably it has a wider distribution, and may even have been collected and taken for the young of some other species, owing to its minute size. In October and November, 1891, it was first found, and some specimens were sent to several conchologists, so to Mr. E. W. Roper, who also recognized it as a new species. In 1893 and 1894 about a hundred were collected, in all stages of growth. Only few of them are quite mature, and almost globular, most adolescent, and, though apparently old, much less inflated. They live in mud among aquatic plants and dead leaves,

and, as a rule, are covered with a black or brown coat, sometimes so thick that they appear to be globules of dirt, and only a sharp eye may recognize them from the hair-like free line along the edge. Some old specimens are badly eroded.

Pisidium punctatum, n. sp. Figs. 7–12.

Shell minute, inequipartite, high, oblique, strongly ventricose, almost globular, regularly and sharply striated, microscopically rugulose, whitish; anterior part moderately long, the edge above oblique, almost straight, end slightly angled, rather inferior; anterior part short, truncate, slightly angular above, rounded below; superior and inferior margins moderately curved, the former rather short, the latter long; scutum little, scutellum moderately marked, both forming slight angles; vertical section heart-shaped, horizontal, short, lanceolate-rhombic; margins very slightly acute; beaks moderately full and prominent, with a longitudinal, slightly oblique ridge (sometimes obsolete) below the culmination; nave moderately thick, whitish, with crowded, small pits, from which it appears as if dotted; hinge moderately strong; cardinal teeth fine, in the left valve two, lamellar, longitudinal, about equally long, a little curved, almost parallel, the upper little anterior; in the right valve one, longitudinal, little curved, lamellar, the posterior end slightly thickened; lateral teeth rather small and thin, in the left valve one, pointed, in the right valve two, the outer quite small; hinge-list fine, rather regularly formed; ligament rather long and fine.

Size; long 1·8, alt. 1·6, diam. 1·3 mill.

Soft parts colorless, rest whitish.

Habitat: Ohio; Tuscarawas River, Bear Run, tributary to the Mahoning River, Portage Co., a spring brook at Rootstown Station, Portage Co., emptying into the Cuyahoga River (Lake Erie and St. Lawrence drainage); in all places collected by the writer.

Figures 7–9 represent an adult, 10 a young specimen, scale 15×1; fig. 11 the hinge, 11a the dorsal aspect of the cardinal teeth in the left valve; fig. 12 shows a remarkable abnormity of the cardinal tooth in the right valve.

This species resembles somewhat *Pis. compressum* Prime, in having a ridge or appendage, but not in the same place, as it stands on the outside, below the culmination of the beaks, while in the mature *P. compressum* it has its place rather on top. The shape of the shell is different, and the size is very much smaller, its bulk being only about one-tenth of that shell. And while the upper part of

the posterior margin in *P. compressum* is rounded or flattened, it is sharp, somewhat "pinched" in *P. punctatum*. In this the shell is purely whitish, or light straw colored, the latter more so when dry, while the mature *P. compressum* is always more or less grayish. A marked feature is the finely and densely pitted interior surface of the shell, the dots being distinctly perceptible through the shell from the outside. Yet this is not unique, as I have also seen it in other Pisidia. Some specimens show not a trace of the appendages on the beaks, yet they are evidently identical.

In the Tuscarawas River this Pisidium appears to be rare, as only thirty were taken, twelve of them in one place, in company of about five hundred *P. campressum*, most of the latter quite young to half grown, *P. cruciatum* and a few *P. abditum*, which is common in pools and ditches. More frequent it is in the Bear Run, where about 120 were collected, but only one-fourth of them adult. Those from the spring brook mentioned above, are somewhat larger, averaging 2·0 millimeters long.

These two well characterized and very small Pisidia are a valuable addition to our molluscan fauna. Besides them there are several other undescribed species from our country at hand. These small mussels have been somewhat neglected and a more assiduous collecting and closer study will doubtless bring to light not only more unknown forms, but also interesting geographical relations.

New Philadelphia, Ohio, Nov., 1894.

HAMINEA VIRESCENS. (Pl. II, fig. 15).

BY MRS. M. F. BRADSHAW.

One afternoon in August, when the low tide of the month occurred, we went to our favorite reef of rocks to see what of interest new or old we could find.

There were acres of mussels with *Purpura saxicola* in great numbers and various colors wedged in between them. These Purpuras are graceful in form and often beautifully colored and striped, and I never tire of them. There were several species of *Acmæa* and *Fissurella volcano* plentiful enough, and as we reached the outside of the reef where the waves dashed at us threateningly, we found a few small *Haliotis cracherodii*, some sea urchins and starfish. These

last we left to the enjoyment of their home in the deep pools among the rocks.

But I wanted to tell you of the real "find" of my summer. On the flat surface of the rocks, and nearest the shore, were small indentations and shallow crevices. While looking into these in search of a possible new Chiton, I saw a gray object which I picked up with the remark that here was some sort of key-hole limpet.

My little companion says: "What is a key-hole limpet?" and so I took out my knife and was about to dissect it to give her a lesson in conchology, but to my surprise I found I had something quite new to myself.

I had very rarely picked up on the beach a small, pale yellow bubble shell never more than $\frac{3}{8}$ inch in length, but had no idea whereabouts this little mollusc had lived. But here in my hand was a real live Haminea, the pale greenish shell so nearly transparent, that it was excusable to at first think it was internal instead of on the creature's back.

The shell was about $\frac{5}{8}$ inch in length, and as we found none larger, was probably an adult, and it covered less than one-third of the mollusk.

The animal itself was a slimy gray globule, not pleasant to touch, and one could not help wondering what possible use or protection was this fragile, inconspicuous, insufficient shell.

Further search revealed several dozen, but they were hard to find even after we knew exactly what to look for, so nearly were they like their surroundings.

After that we searched for Haminea in all similar places for several miles of our coast, but never again found them; so I am still of the opinion that they are rare in this locality.

Monoceros engonatum is not rare on this coast I believe, but I never found them until that day, I got two, one a fourth of a mile from the other. Careful search failed to reveal more, though these individuals could not be living alone, and I have no doubt had only taken a short excursion, leaving the rest of their families safely at home.

The field of my observations has been but limited; situated about midway between Los Angeles and San Diego, but I think it is a locality rich in the number of its species.

NEW FORMS OF AMERICAN SHELLS.

BY H. A. PILSBRY.

Gastrodonta (Pseudohyalina) lateumbilicata n. sp.

Shell resembling *Ps. limatula* in color, texture and sculpture, but much depressed, the upper surface almost flat, last whorl of much smaller calibre, the umbilicus very much wider, shallow, its cavity widely open and saucer-shaped, much as in *Helicodiscus lineatus.* Alt. 1·4, diam. 4·3 mm.

Hab., near Woodville, Alabama. Coll. by H. E. Sargent, whose labors in northern Alabama have been remarkably fruitful in increasing our knowledge of the conchology and mammalogy of Alabama, as well as in his chosen work as an educator.

Somatogyrus Sargenti n. sp.

About the size of *S. aureus* Tryon, but shouldered as in *S. subglobosus* Say, and imperforate. Shell globose-turbinate, light olive-green, smooth except for fine growth lines. Whorls about 4¼, those of the spire very convex and separated by deep sutures; last whorl shouldered above, flattened toward the suture, large and convex. Aperture large, ovate, a little flattened on the parietal side, broadly rounded below, narrowly rounded above, and angular at the upper insertion of the lip. Columella concave, moderately heavy, the callus becoming wider at the umbilical region; parietal wall with a transparent callus layer. Alt. 6, diam. 5 mm. Mud Creek, a tributary of the Tennessee R., Ala.; coll. by Prof. H. E. Sargent.

This species differs from *S. integer* and the closely allied species or varieties *depressus, aureus* and *parvulus* in its shouldered whorls, planulate below the suture. It has no such heavy columellar callus as *S. currierianus;* and it is a smaller species than *S. subglobosus* (isogonus) of Say, with wholly closed umbilicus and differently formed columella.

RANGIA THE PROPER NAME OF THE MACTROID GENUS GNATHODON.

BY THEODORE GILL.

Mr. Dall, in the NAUTILUS (VIII, 27) and Proc. U. S. Nat. Mus., (XVII, 91), has shown that the generic name *Gnathodon* was

introduced before *Rangia* for the same genus of Mactroid bivalves. Nevertheless, the former name must give place to the latter, because it had been previously used in zoology for a different genus. Ever since Mr. Dall communicated to me the results of his investigations, I had a dim recollection of having seen the name used in another sense, and that *Rangia* would have to stand, but could not recall any circumstances connected with it. Having had occasion recently to refer to the Plectognath fishes, I recalled that the name *Gnathodon* had been given to a combination of the genera *Tetrodon* and *Diodon*, because neither of the latter was applicable to all the forms of the composite genus. It was Goldfuss in 1820 who thus used the name in his "Handbuch der Zoologie." I have not access at present to a copy of Goldfuss' work,[1] but have verified my recollection by reference to Cuvier and Valenciennes' "Histoire Naturelle des Poissons," (I, 226), where, in a summary of the work, the name is thus mentioned "*Gnathodon (Diodon Tetrodon.)*". Of course, the name is not active in ichthyology, and, also of course, it is not recorded in any of the Nomenclators of zoology, but, in accordance with the law "once a synonym always a synonym," the previous application of the name in ichthyology precludes its use in conchology.

A NEW VARIETY OF OLIVELLA.

BY JOHN FORD.

Some months ago, I received from my friend, Mrs. E. M. Gaylord, of Alameda, Cal., a suite of Olivella which had been found by her in a box of shells that apparently came direct from the Gulf of California.

All of the associated species were well known Gulf shells, and as the Olivella were in the same fresh condition as the rest, there was no reason to doubt that the entire lot had been secured simultan-

[1]Handbuch der Zoologie, von Georg August Goldfuss, Nuernberg, 1820, being the Zweite Abtheilung of the Dritter Theil of Dr. G. H. Schubert's Handbuch der Naturgeschichte. *Gnathodon* appears on page 100, is suitably diagnosed, and includes as sections *Orthragoriscus* Schn., *Diodon* L. and *Tetrodon* L.—Ed.

eously, and, probably, at the same locality. In view of this conclusion, also of the fact that the specimens are in some respects distinct from any heretofore known to me, or, so far as I can learn, to any writer on conchological matters, I assume the responsibility of naming and describing them as follows:

Olivella gracilis Gray. Var. **Gaylordi** Ford. Pl. II, fig. 14.

Shell similar in outline to *O. gracilis,* but much smaller, general color bluish-grey, with a well defined interrupted band of a lead-black hue bordering the upper part of the final or body whorl.

Smaller spots of a like hue also appear at the upper edge of the fasciole. Circling the middle portion of the whorl is a number of irregular brownish lines, which also occur less prominently on the fasciole. In some specimens a splotch or two of the same color as the interrupted band referred to, appears on the upper part of the preceding whorl. Apex very acute and free from spots. Length of aperture rather more than one-half that of the shell; dorsal portion of the extreme base creamy white. Average length of specimens 9 to 10 mm., width 3·2 to 4 mm. Hab., Gulf of California.

Mrs. Gaylord, for whom the variety has been named, is not only a practical collector, but an unusually earnest and capable conchological student also. It gives me great pleasure, therefore, to associate her name with the beautiful specimens referred to.

FERUSSACIA SUBCYLINDRICA AND TWO NEW SPECIES IN JACKSON CO., ALABAMA.

H. E. SARGENT, WOODVILLE, ALA.

The pleasure which thrills the field naturalist upon locating with in his range, a species previously unknown to the region, must be experienced to be appreciated. It is my privilege at this writing to report three such finds.

Late last November, at the end of a shell hunt of two hours, which had among other things brought to light several fine specimens of *H. obstricta* Say var. y, I chanced to detect for the first time a specimen of *F. subcylindrica* L.

Its station was a flat surface rock about thirty feet square, at an angle of 30°, with a north exposure. Having a sack with us, my

assistant and I proceeded to "bag" the leaf mould. While doing so another new thing attracted my attention. Upon comparing it with a single specimen of *Z. limatulus* Ward in my collection, I pronounced it the same with a question and sent it to the Editor for verification. He writes "Your *limatulus* I find, on comparing with typical specimens, are much flatter and have wider umbilicus. I therefore, call them *Gastrodonta* (*Pseudohyalina*) *lateumbilicata* n. sp."

Daylight failing and being a mile from home in a ravine 500 feet below home level, and only the bed of a mountain torrent for foot-path, we could only carelessly collect the bushel of mould which we brought away, doubtless leaving many specimens. Upon assorting the material the following was the result:

Ferussacia subcylindrica L., 245. *Pomatiopsis lapidaria* 48.
Gastrodonta lateumbilicata Pils., 200.

G. capsella Gld., 25.	*Z. indentatus* Say, 18.
G. interna Say, 18.	*Helicodiscus lineatus* Say, 5.
Patula perspectiva Say, 51.	*Helix spinosa* Lea, 1.
H. stenotrema Fer., 3.	*H. inflecta* Say, 4.

A subsequent visit to another part of the same ravine resulted in the finding of 50 more specimens of *G. lateumbilicata*, but none of *F. subcylindrica*. I have since received two specimens of the latter from another locality not far distant.

This trip also resulted in the finding of two living specimens of *Gastrodonta acerra* Lewis, the gem of our American *Zonites*. A number were also found which had been broken into and eaten. Query; may not the rarity of this species be due to its delicate shell and habit of remaining among the loose leaves rather than burying itself in the mould as does its more thrifty neighbor *Omphalina laevigata* Pfr.?

This is thus far the only station at which I have found *G. acerra*.

A new species of Somatogyrus for which the name *Somatogyrus sargenti* Pils. is proposed, is found in considerable numbers, twenty miles northeast of here in a spring, tributary to Mud Creek, which is in turn tributary to the Tennessee River. It is found attached to the dead leaves in company with one species each of *Physa*, *Planorbis*, *Limnaea* and *Goniobasis*.

NOTES AND NEWS.

The Conchologists Exchange was started so oddly (on a postal card) and ended so abruptly—and without an index to either volume, that we are constantly receiving letters of inquiry regarding its contents, numbers, etc. We once proposed to make a reprint, but could not obtain sufficient subscribers to warrant it. We now propose to print an index of both volumes, if enough of our subscribers want it to pay for the cost of printing. The index will contain a list of contributors with the titles of their articles, and a list of the species mentioned. Those wishing an Index will please send twenty-five cents to the Editors. It will be printed as soon as sufficient money is received.—H. A. P. and C. W. J.

There is being built at Finderne, N. J., a large Casino Building, one room of which is to be devoted to Natural History. Mr. Thomas Morgan, of Somerville, N. J., has been appointed Curator. He intends placing there his entire collection. Any donation of specimens will be thankfully received.

Dead Snails.—On the 14th of last April, (1894), I turned over a log in the woods in Miami Co., Ohio, and found, all in a heap, the following shells: 74 adult *Helix elevata*, 38 young of same, 1 *H. profunda*, 9 *H. alternata*, 1 *H. albolabris* and 2 *H. hirsuta*, making in all 125 individuals. They were all dead but well preserved, and many were clean inside so that they would make good cabinet specimens. Besides these perfect shells there were many so broken that they could not be readily identified.

How can we explain this? Did these mollusks seek the warmth to be derived from a number huddling together, or were they acted upon by the common impulse of protection? Were they destroyed by insects, or did they perish by the cold? The preceding winter was an unusually mild one, and the size of the log and quantity of leaves which surrounded them would preclude the latter theory. The fact that so many were so thoroughly cleaned inside would seem to show that some insects as ants had made an attack upon them and eaten them. What are the enemies of our common snails? I have often found perfectly clean dead shells under logs.—*G. D. Lind, Lebanon, Ohio.*

An interesting study of *Scissurella*, illustrated with figures of the living animal and dentition, by A. Vayssière, of Marseilles, is pub-

lished in the current number of the Journal de Conchyliologie. The external features as well as the dentition differ very widely from *Pleurotomaria*, the teeth being as in *Trochidæ*.

In Abstr. Proc. Linn, Soc. N. S. Wales, meeting of Sept. 26, 1894, Mr. John Brazier retracts his former opinion that *Patella kermadecensis* is not from the Kermadec group, and quotes from a pamphlet published in 1887, stating that on Macauley Island there occur "large limpets (as big as small saucers and good eating)."

The last number of the Journal de Conchyliologie contains a portrait and biographical sketch of Dr. Paul Fischer.

PUBLICATIONS RECEIVED.

On a Molluscan Genus new to, and another forgotten from Australia, By Charles Hedley (Proc. Roy. Soc. Vict., 1894).—*Lucapinella* is identified from Australia with two species, *nigrita* Sowb. and *pritchardi* Hedley. *Scyllæa pelagica*, recorded by Cuvier from W. Australia years ago, has lately been collected at Port Philip by Mr. J. B. Wilson.

Description d'un Hélicéen nouveau provenant de la cote occidentale du Maroc, par Ph. Dautzenberg (Bull. Soc. Zool. de Fr. 1894, p. 17).—*Helix* (*Jacosta*) *Renati* is described and figured. We cannot distinguish it from *H. argonautula* Webb & Berth., a species referred by European authors to *Ochthephila* or *Discula*, but really belonging to *Jacosta*.

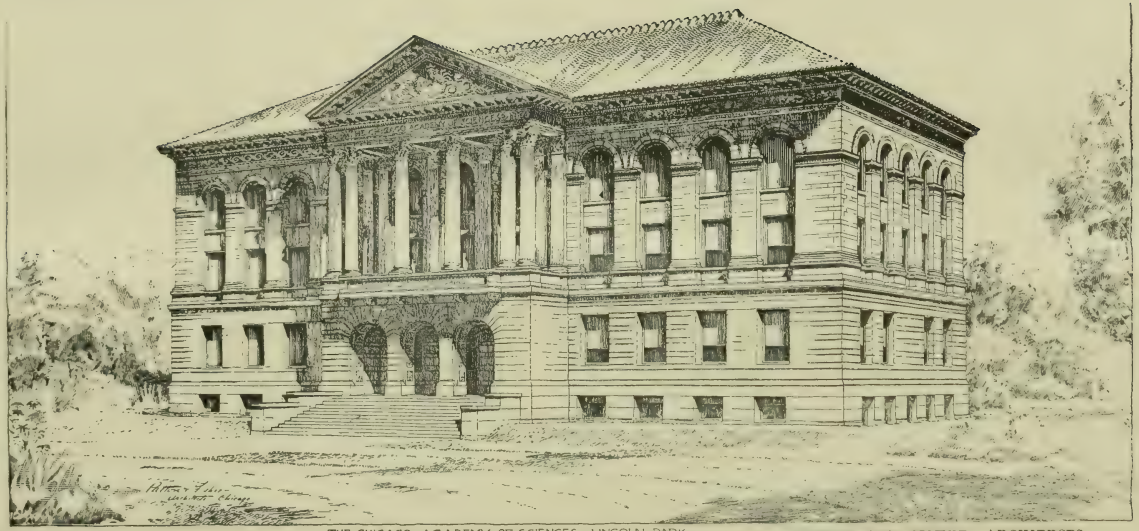
The Land and Freshwater Moll., New Philadelphia, O., by Dr. V. Sterki.—A list freely annotated with Dr. Sterki's habitual critical acumen recording 151 species. The new forms described are *Pupa curvidens var. gracilis*, "intermediate in shape between the type and *P. holzingeri*;" *P. pentodon f. curta*; *Vertigo ventricosa v. elatior*; *Planorbis exacutus var. rubellus*. *Gundlachia* is reported, and two *Pisidia* described in the preceding pages are noticed.

Ueber Binnen-Conchyl. der Küstenzone von Rio Grande do Sul, von Dr. H. von Ihering.—From the study of land snails found in Quaternary deposits the conclusion is reached that formerly the region in question was wooded, and more favorable to snail life than the present sandy expanse with sparing grass growth. In the living fauna a remarkable new genus of *Succinidæ* occurs, like a *Hyalimax* with completely internal, spireless shell.

Die Susswasser-Bivalven Japans, von H. von Ihering (Abh. Senck. naturforsch. Gesellsch.).—In the discussion of the species, this work supplements Kobelt's Fauna Japonica, describing several new specific forms. In the Japanese bivalve fauna, v. Ihering finds only East Asiatic types, and those occupying the entire Holarctic tract (such as *Margaritana margaritifera*). There are no peculiar forms of more than specific value, the fauna being merely a part of that of the adjacent Siberian and Chinese countries, unspecialized except in the specific characters, and many of the species are very near those of the mainland. It is interesting to find that these results coincide with the facts known in regard to the freshwater gastropods and the land shells. Except that the mollusk fauna of Japan has a more southern aspect than that of the adjacent mainland (due to the warm ocean current, the "Gulf stream of Japan"), there is no difference of any importance in zoogeography.

Preliminary List of the Mollusca of Arkansas, by F. A. Sampson (Ann. Rep. Geol. Surv. Ark., Vol. II).—81 species are the result of several years work by Mr. Sampson, not including *Unionidæ*, which will be treated separately. The State has been little known to conchologists hitherto, and the present catalogue supplies data for the southwestern range of a considerable number of species. It is judiciously annotated, and illustrated with woodcuts of *Triodopsis edentata* Sampson.

A Biological Examination of Lake St. Clair (Bull. Michigan Fish Commission, No. 4).—The present preliminary account details the methods adopted by the Michigan Fish Commission, with brief lists of the various forms of life, a map of the lake, etc. The mollusks were studied by Mr. Bryant Walker and listed on pp. 43, 44. More elaborate reports on the principal groups are in preparation.



THE CHICAGO ACADEMY OF SCIENCES LINCOLN PARK

PATTON AND FISHER, ARCHITECTS.

The Nautilus.

Vol. VIII. FEBRUARY, 1895. No. 10

A GLANCE AT THE CHICAGO ACADEMY OF SCIENCES.

BY FRANK C. BAKER, SECRETARY.

In 1857, a society for the promotion of science, was formed in Chicago, taking the name of "The Chicago Academy of Natural Sciences." About $1.500 was subscribed, a room taken in the Saloon Building, corner of Clark and Lake Streets, a few cases were made, and a museum was begun. In 1859, the society was incorporated by the name of "The Chicago Academy of Sciences."

In the winter of 1863–4, several prominent citizens of Chicago resolved to found a Scientific Museum in the Metropolis of the Northwest. A large sum of money was accordingly subscribed, an Act of Incorporation, (1865) as now published, was obtained and the Academy was placed upon a solid foundation. Mr. Robert Kennicott was appointed first Director of the Museum. Collections rapidly rolled in and rooms were taken at the Metropolitan Building, corner of Randolph and La Salle Streets. In 1865 Mr. Kennicott, with a party of young naturalists went to Alaska to survey a route for a telegraph line, then proposed to connect North America with Russia. From this expedition Mr. Kennicott never returned. He died suddenly of heart failure on the banks of the Yukon River. After the death of Mr. Kennicott, Dr. William Stimpson was appointed Director of the Museum.

June 7, 1866, the building in which the Museum was placed was partially destroyed by fire. The collections were much damaged,

and parts were wholly destroyed. This calamity brought the question of a permanent building to head, and a lot on Wabash Avenue, north of Van Buren Street was purchased and a fire-proof building erected. The first meeting was held January 28, 1868. The building was of brick 55 feet by 50 in area, and 50 feet high; the floors were of brick and iron the stairways and principal doors of iron, and the windows were covered with iron shutters. The basement was used for laboratory and storeroom; the first floor for library and offices, while the whole upper part, surrounded by two wide galleries, was occupied by Museum. From this time until the great fire the growth of the Academy, under the skillful management of Dr. Stimpson was rapid, and much valuable original work was done.

On the 9th of October, 1871, this building, in spite of the fire-proof qualities which it was supposed to possess, was totally destroyed in the great conflagration which laid Chicago in ashes,—specimens, library, manuscripts, and apparatus—all that was left of the once invaluable collections was a sheet of printed paper and a few pieces of broken pottery. Within twelve days after the fire, however, a meeting was held and steps taken towards a restoration of the Academy. A circular was issued inviting the sympathy and help of corresponding societies, which elicited many immediate and liberal responses. The loss of his priceless manuscripts so prostrated Dr. Stimpson that he died on the 26th of May, 1872.

It was soon determined to rebuild upon the old site, and upon the same plan modified by such improvements as experience could suggest. Upon the front of the same lot a business block of the first class, four stories in height was erected. The restored building was occupied in the fall of 1873. The funds at the disposal of the Academy being insufficient for their needs, they borrowed such additional sums as were necessary, securing the lender by a mortgage upon the whole property. They estimated that the income from the property would provide a sinking fund by which the original indebtedness would be paid when it became due. The scheme, however, proved disastrous. The new building did not pay the interest on the indebtedness, and after a term of years, in process of law, the whole property was lost to the Academy.

When, in 1886, the Academy was finally driven from its home on Wabash Avenue, the Exposition Company received the collections within its building upon the lake front and paid the expense of their

maintenance. But in its turn, the exposition company was ousted and its building destroyed. The property of the Academy was sent to storage where it remained for several years. In 1891 when the affairs of the Academy seemed to have reached their lowest ebb, a proposition was made to unite its fortunes with the University of Chicago, then just organizing. This the Academy was not willing to do, feeling that in time the identity of the organization would become lost in that of the University. In 1892 a generous citizen of Chicago Mr. Matthew Laflin, seconded and aided by his son George K. Laflin promised to give a sum adequate for the purpose of erecting a building which should stand for all time as the home of the Academy. In addition to this, it was ascertained that it was possible for the commissioners of Lincoln Park to aid in the prosecution of such an enterprise by offering a site and additional endowment. The result is one of the most perfect museum buildings situated in one of the most beautiful parks in the world. In June, 1893, the corner stone was laid and Nov. 1, 1894, the building was formally thrown open to the public.

The new building is a plain rectangular structure measuring 150 by 50 feet. The material of the building is Bedford stone and the architecture is Romanesque. Over the central doorway is the inscription MATTHEW LAFLIN MEMORIAL. The interior is decorated in old gold and ivory giving a soft tone to the light. There is electricity, running water, electric bells, elevator, and all the modern improvements which go to make up a perfect museum.

The library contains 5000 scientific works. It communicates with the museum by two stairways. The museum hall is 150x50x30 feet, with one wide gallery. Upon the main floor there are 24 large cases, in the gallery the same number with the addition of a large rail case. Unlike most museums *there is not a dark corner in the building*, from cellar to garret.

The collections consist for the most part, of North American productions, and are most complete so far as the valley of the Mississippi is concerned. In Mollusca, the collection is rich in North American forms.

With a new building and the best of facilities, it is believed that the Academy will again occupy a prominent place among Scientific bodies, and regain the prestige and fulfil the promise of its earlier days.

ON A NEW SPECIES OF HOLOSPIRA FROM TEXAS.

BY WM. H. DALL.

Holospira pasonis n. sp.

Shell white, mostly smooth but hardly glossy, of eleven and a half whorls; two and a half smooth, inflated, nepionic whorls, the apex flattish, followed by several whorls which are minutely ribbed in harmony with the incremental lines, the ribbing gradually becoming obsolete over most of the shell but reappearing on the last whorl, especially the basal part, sharper and somewhat crowded just behind the reflected lip; umbilicus closed or reduced to a minute chink; suture distinct, sutural edge continuing as a keel to the reflected margin of the aperture; aperture very short necked, almost circular broadly reflected; the pillar, as usual in the genus, tubular above the last whorl, the axis externally simple but somewhat flexuous. Lon. 22·5, max. diam. 6·5 mm. El Paso County, Texas, from Mule cañon at an elevation of 4000 feet. This species is nearest to *H. coahuilensis* W. G. Binney, which has one or two more whorls, the last two proportionately more attenuated with more extended, sharper and more distant sculpture, and obtusely keeled or compressed base resulting in a much more triangular and narrower aperture. It is not particularly close to any of the other species hitherto described, the *H. semistriata* Stearns being quite distinct. A marked character is the evenly rounded basal part of the whorl just behind the lip.

The specimens were procured by a correspondent of Mr. J. A. Singley.

MEGATEBENNUS BIMACULATUS.

BY MRS. M. F. BRADSHAW.

One day last September I found a curious and interesting mollusk. On a ledge of rocks, so high as only to be reached by the waves at the highest tides, there was a hollow containing a barrel or more of water.

Poking around in this I saw what appeared to be a bit of flesh. I took it out, thinking I had found a small *Lucapina crenulata*,

whose shell is—or appears to be—internal. But this one wore his shell upon his back for what purpose I do not know, for it was too small for protection, and the creature himself was so unpleasant to look at, no beauty of shell could redeem his ugliness.

Red-brown in color, warty, even the inadequate shell was a dull greenish-grey; not a single pretty feature!

Only an enthusiast could have taken him up with a thrill of pleasure, instead of a qualm of disgust.

Upon examination at home, it was determined to be *Fissurellidæa bimaculata;* yet the shell does not quite tally with the description in West Coast Shells. Internally it is white, outside gray-green with fine sculpturing; the rays running from the aperture to the edge are strong, the circular ribs faint, and the margin is not crenulated. *F. bimaculata* is said to be ¼ in. in length; this one is more than double that size. And the dark spots on the sides are not visible. If the green stain could be removed perhaps they would appear; but as the size is too great for bimaculata, perhaps I have a Fissurella not credited to this coast.

ON COLLECTING PISIDIA.

BY DR. V. STERKI.

Pisidia, and for a good part Sphaeria, are by far not sufficiently known, systematically as well as geographically. Requested to do so, and encouraged by prominent conchologists, the writer is going to work them up. Already some valuable materials are at hand; thus the entire Pisidium-collection of Mr. E. W. Roper, numerous lots, most from Lake Michigan, sent by Mr. Bryant Walker, others from Mr. H. Prime and other conchologists, besides my own collection; and some good results have so far been attained. Yet these materials are absolutely insufficient for a thorough study and knowledge of these small mussels which, with all their minute size, are a very conspicuous and interesting part of our molluscan fauna. They should be studied in their different forms, considerably variable according to their habitats, and all kinds of waters should be searched for them all over the continent.

Whoever has collected Corbiculidae assiduously will know that they are, as a rule, present in large numbers, wherever found. The

best means for collecting them is a rather long (8–12 inches) net of strong canvas, such as used for embroidery work, fastened to a ring of strong wire[1], five to eight inches diameter, with a handle, to be used either directly, or fastened to a stick, or pole up to ten or twelve feet long. For deep waters a dredge should be used. The "stuff" gathered is shaken and washed until the remains are free of fine mud, then in a basket, sack, or some other suitable receptacle brought home, where the mollusks, Corbiculidae and others, may be picked out at leisure. If they are not to be kept alive, it is best to spread the materials on large pieces of paper, or cloth (bed sheet e. g.) and let them become dry. In this way, especially if one or several fine sieves are used, they are most easily found; and none of them should be overlooked, as some forms are very minute, and the young of all are of interest, while fully grown specimens are comparatively scarce, and so are certain species in some places. If sent for examination, all from a locality are best left mixed up, and not separated, but with notes on the nature of their habitat.

Hundreds, and thousands of specimens may be secured in a short time, not to speak of other mollusks, among which, last not least, very young Unionidæ. The best places are, as a rule, among aquatic plants, and also in deep places, or holes, where the mussels are washed together. But it must also be said, that they are found most actively propagating in late fall and early winter.

New Philadelphia, Ohio, Jan., 1895.

NOTE. In Dr. Sterki's article in the January NAUTILUS, the word *nacre* should be read instead of "nave" on page 97, 9th line from foot of page, and also on page 99, 16th line from top.

Pisidium punctatum has also been found in Lake Michigan and in Herkimer Co., N. Y.

NEW AMERICAN FRESH-WATER MOLLUSKS.

BY H. A. PILSBRY.

Planorbis alabamensis n. sp.

Shell small, whitish corneous, solid, lens-shaped; intermediate in form between *P. exacutus* and *P. dilatatus*. Upper surface convex,

[1] Where fastened to the wire, the net should be enveloped with strong cloth, or leather, lest it will wear off; and the seams should be securely sewed.

but the apex is slightly sunken; whorls nearly three, slightly convex, rapidly widening, acutely keeled at the periphery, the keel projecting above the suture on the penultimate whorl in most adult specimens. On the last whorl the keel is about median in position, is acute, as if pinched out, and extends to the aperture. Base of shell convex, rising toward the umbilicus, which is moderately large and funnel-shaped, with very obtusely angled margin. Aperture small, oblique, sub-rhombic; the lip strongly thickened within. Alt. 1·8, diam. 3·4 mm.; width of aperture 1·6 mm.

Woodville, Alabama (Prof. H. E. Sargent). This is a smaller species than *P. exacutus*, with much smaller less oblique aperture, thick lip, and not so flattened. It differs from *P. dilatatus* in the acute peripheral keel, etc.

Amnicola olivacea n. sp.

Shell olive-colored, somewhat intermediate in form between an ordinary *Amnicola* and *Pomatiopsis lapidaria*. Spire elevated, the apex rather acute. Whorls 5, very convex. Aperture ovate, less than half the length of the shell, angular above; peristome free except for a very short distance on the parietal wall; umbilicus rather large. Surface smooth; coated with iron oxide in the adult specimens seen.

Alt. 4·2, diam. 2·5 mm. (Male?).

Alt. 4·2, diam. 3 mm. (Female?).

Huntsville, Ala. (coll. by Prof. H. E. Sargent; see NAUTILUS for December, 1894, p. 95).

This form is quite distinct from other *Amnicola*, being of more elongated contour than any other Northern forms except *A. lustrica*. Its nearest allies are some of the smaller slender Floridian forms, but none of these have such convex whorls. As I have seen dry specimens only, I have not verified the reference of the stouter individuals to the female sex, but from analogy with other species this is probable. The supposed males have much the general appearance of *Pomatiopsis cincinnatiensis*.

Planorbis bicarinatus aroostookensis n. var.

Shell having the spire and umbilicus very deep, the latter funnel-shaped as in typical *bicarinatus*, but both upper and lower keels entirely obsolete or rounded off on last whorl, which has the aspect of that of *P. trivolvis*. Surface minutely striated spirally as in *P. bicarinatus*. Aperture less angular and less produced below than in *bicarinatus*, in consequence of the rounding of the whorls. Diam.

15, alt. at aperture 7½ mm. Specimens from East branch of Salmon brook, Woodland, Aroostook Co., Me., coll. by O. A. Nylander, Caribou, Maine.

Vivipara georgiana limnothauma n. var.

Whorls much swollen around the upper part, sloping below, giving a shouldered appearance. This is one of the most remarkable forms of *Vivipara* yet made known. Types are from an aboriginal shell-field on Hitchen's Creek, but it also occurs living in Lake George, 2 fms., off Drayton's Island (Pilsbry and Johnson coll.).

MOLLUSKS OF ALLEGHENY CO., PENNSYLVANIA.

BY GEO. H. CLAPP, PITTSBURGH, PA.

Below is given a list of additional species of land and fresh-water shells collected in Allegheny Co., Pa., to be added to the list published by Mr. S. H. Stupakoff in the NAUTILUS, April, 1894.

Hyalina cellarius Müll.
Hyalina nitidus Müll.
Mesodon mitchelliana Lea.
Pupa curvidens Gld.
Succinea aurea Lea.
Succinea obliqua Say.
Limnæa parva Lea.
Gyraulus dilatatus Gld.
Pleurocera canaliculatum Say.
Goniobasis ? (Young).
Unio ovatus Say.
Unio rectus Lam.
Unio pilaris Lea.
Unio crassidens Lam.
Unio luteolus Lam.
Unio gracilis Lam.
Unio rubiginosus Lea.
Unio orbiculatus Hild.
Unio securis Lea.
Unio cornutus Bar.
Unio undulatus Bar. (?) dead [broken shell.
Unio obliquus Lam.
Ancylus tardus Say.
Ancylus rivularis Say.

From the previous list, *Mesomphix lævigatus* Pfr. should be dropped. I have found *Mesodon sayii* Binn. in Beaver Co., but have not, so far, found it in this county.

NOTE ON UNIO OREGONENSES LEA.

W. G. Binney

For years I have been puzzled over a shell in the Lea collection of Naiads which Lea received from Wheatley as coming from the

Columbia river, Oregon and which the former named *U. oregonensis*, discribing and figuring it in Trans. Am. Phil. Soc. X, p. 275, pl. 22, fig. 33. The specimen is in bad condition, being somewhat broken and considerably eroded. In a paper on the Relationships and Distribution of the North American *Unionidæ*, with notes on the West Coast Species, which I published in American Naturalist, Vol. XXVII, No. 316, I stated that I had come to the conclusion that the specimen in question was a form of the widespread and variable *Unio luteolus* Lam, there being examples in the National Museum from Canada very much like it. I believed that if it really came from the Columbia river it was just possible the young might have been carried in mud on the feet of aquatic birds, from waters near by which drain into the Missouri, in which stream *U. luteolus* is found. But I have never been quite satisfied with my determination of the shell, since it always seemed to resemble to some extent a group of the Mexican species. To-day, in carefully going over all the Mexican and Central American Naiad material in our own and the Lea collections I suddenly discovered a surprising resemblance between the Lea specimen and some others of *U. rowelli* Lea, and on careful comparison I found it to be undoubtedly an old, solid, and inflated female of that species.

Unio rowelli is a remarkably variable form which I cannot for a moment doubt is exactly synonymous with *U. macneilii* Lea, the types of both species being in the Lea collection. Lea calls attention in his description to its resemblance to *U. sapotalensis*, to which it is closely related, and it may be remarked in passing that in this group the females and males are separate, the former being inflated in the posterior ventral region like those in the *Luteolus* Group. Some specimens of this protean species are much inflated, others are compressed; some are somewhat triangular and pointed at the base of the posterior slope, without a trace of biangulation, others are nearly rhomboid and distinctly biangulate; there is considerable variation in the degree of sulcation, and in the coloring of the epidermis. They may be either uniform greenish-yellow, brownish, or marked with distinct and delicate radiating stripes as in the type of *U. oregonensis*. And all these variations may occur in a lot from a single locality.

The cardinals are rather compressed, double in the left and single in the right valve, and have a peculiarly rough, torn appearance; while the laterals are somewhat striated longitudinally.

As *Unio oregonensis* was described probably about the year 1852, *rowelli* in 1859, and *Macneilii* in 1874, the former should have precedence. But it may be set down as an absolute certainty that no member of the group to which this species belongs was ever found nearer than 1500 miles from the Columbia river, and the locality is undoubtedly an error. As the name *oregonensis* is, therefore, misleading, I think we are justified in applying to the species the next oldest name, *Unio rowelli* of Lea. As I have shown in the article referred to in American Naturalist that *Unio famelicus* Gld. of the Columbia region is only a young *Unio multistriatus* Lea, of Brazil, I think I am safe in saying that no Unios are known to inhabit North America west of the great Rocky Mountain chain; this being the largest area distitute of *Unio* life in the temperate or tropical regions of the globe.

NOTES AND NEWS.

Mr. A. A. Hinkley has removed from Du Bois, Ill., to Rockford, Illinois, which will be his address in future.

Mr. Edw. W. Roper and Mrs. Roper sailed for Jamaica on Dec. 19, to spend the winter collecting shells and ferns.

A Train Stopped by Snails.—Mr. Laille, an engineer in the employ of the Tunisian Railway, writes in the *Dipeche Tunisienne:* "The train coming east from Suk-el-Arba last Thursday was two hours late for a very singular reason. The road was literally covered with snails, the wheels of the locomotive crushing these mollusks into a pulp, which destroyed all adherence and caused the locomotive wheels to skate, so to speak, in their places. We have seen flocks of locusts stop trains, but I think the fact that snails can stop a train is without a precedent. These snails are very general all through Tunis, especially during the rainy season; the smallest remainders of green on field or tree are covered with them, so much so that they appear like a bunch of grapes hung up, only that their white shells produce a curious effect."—*Phila. Record.*

Mr. John B. Henderson of Washington, D. C., has sailed for Japan, with Mr. John W. Foster, to be absent about three months.

Helcioniscus nigrisquamatus.—By error, the word "not" was printed for *now*, in line 11 from bottom of Mr. Taylor's article on this species, October number, p. 66. As it completely changes the meaning of the sentence, this correction should be made.

FULGUR PERVERSUM is a rare shell on the coast north of Delaware Bay, if, indeed, it occurs at all living. Mr. Curtis Smith has recently found dead and blackened (fossil?) specimens at Wildwood, N. J.

PROF. H. E. SARGENT of Woodville, Ala., called upon his friends in Philadelphia on the 26–28th inst. He purposes to be in New England for the next month or more.

NEW PUBLICATIONS.

THE LIFE AND WRITINGS OF RAFINESQUE, By Richard Ellsworth Call.[1] (Filson Club Publications, No. 10).—To most naturalists, a peculiar charm attaches to the personalities of their predecessors in the same field of endeavor. And we of to-day, who may fairly be reckoned as the third generation of nature students in America, have a natural curiosity to know something of the men of that first generation, to whom the "New World" was indeed new—who enjoyed in such generous measure that intense delight which can only be felt or apppreciated by the field naturalist in the presence of forms of life new to him. Rafinesque, the subject of Mr. Call's present work, has been much less familiarly known to us than any of the other pioneers in American zoology; he was misunderstood by most when living, and scoffed at dead. It is, therefore, with unusual interest that we follow the tale of his eventful life as it is here related. Mr. Call, after telling of his early training, or rather lack of training, follows his hero to France and then to Sicily, where Rafinesque's life work was begun, and his peculiar characteristics as a naturalist were developed. When he finally left that sunny island for America, he was already the author of many works and papers on numerous branches of zoology and botany, though only thirty-two years of age. His career of misfortune in America—relieved only by the intense pleasure of his work—is graphically described, the period covered by his life in Kentucky being given most space, this time covering Rafinesque's most important contributions to American science. Two portraits of Rafinesque are reproduced, as well as an autograph letter and sample pages of some of his works, all by good photo process engravings. The volume concludes with a bibliography, which seems to be complete.

The character of Rafinesque is appreciatively interpreted by Mr. Call, and his shortcomings are as leniently mentioned as strict re-

[1] Louisville, Kentucky, 1895, 4to. pp. xii, 227.

gard for right will admit. Acknowledging frankly the great defects of the eccentric naturalist's work, its value and genius are still considered by Call to be very considerable. There can be no doubt that in the appreciation of *natural groups*, Rafinesque had great insight, as his biographer claims; but still we can hardly endorse the statement: "considered as a whole, the conchologic work of Rafinesque was remarkably well done." From some acquaintance with that work, we would rather call it remarkably *badly* done, and only saved from worthlessness by certain glimmers of genius, in the ability to grasp natural groups. Some facts of value could have been obtained had Mr. Call corresponded more freely with Philadelphians, as here Rafinesque spent many years. Among other things, the statement in regard to the Poulson collection of Rafinesque's *Unionidæ* on p. 109, would not have been made. This collection was collected and labelled by Rafinesque, was procured by Tryon from Poulson's estate and is now preserved in the collection of the Academy of Natural Sciences of Philadelphia.

As a whole the volume seems remarkably free from mistakes of any kind, considering the difficulty of the subject. The typography is superb. The proof-reading is almost perfect, though we note a very few slips, such as "profligate" for prodigal, on p. 75. It is printed on fine paper, with wide margins, and is altogether a beautiful piece of book-making. We trust it will find a place on the shelves of conchologists and naturalists generally, and lead to a more just appreciation of this great though erratic genius.

The Mechanical Cause of Folds in the Aperture of the Shell of Gastropoda, By Wm. H. Dall (Amer. Nat., Nov., 1894).—The plicæ and folds found in the aperture and throat of gastropod shells are explained by the wrinkling of the mantle when retracted into the gradually narrowing caliber of the shell, and pressed between the solid foot and the shell wall. The semi-fluid secretion of which the shell-lining is built up is exuded from the whole surface of the mantle, but becomes rubbed off where the summits of mantle-folds press against the shell, gradually accumulating in the interstices between these folds. It is found that in shells having the ridges extending far inward, the adductor muscle is attached far within; in those having no folds, or only at the margin of the aperture, the adductor is attached to columella lower down. The deeper this attachment, the greater the distance over which the mantle is drawn, and consequently the greater its folding by compression, and the more emphatic the shell-ridges deposited by it.

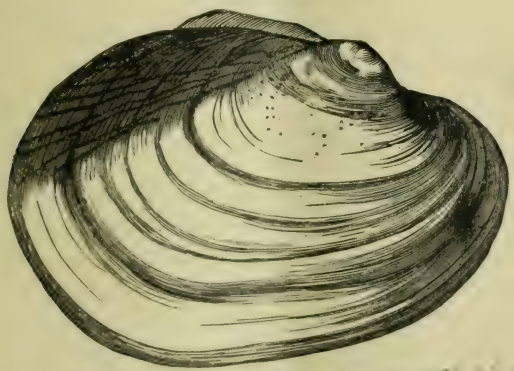
THE NAUTILUS.

VOL. VIII. MARCH, 1895. No. 11

UNIO OCHRACEUS AND CARIOSUS.

BY CHARLES TORREY SIMPSON.

The senior editor of the NAUTILUS has asked me to point out in a clear concise way the specific differences between *Unio ochraceus* Say, and *Unio cariosus* Say. They were both described in Nicholson's Encyclopedia, in an article on conchology, by Say; and the work, which is now long out of print, is exceedingly rare, and out of the reach of the ordinary student.



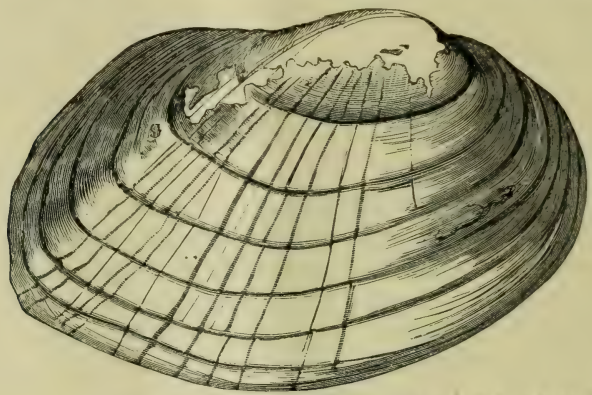
Union ochraceus Say.

Both belong to a great assembly of North American forms fairly typified by the well known *Unio occidens*, it being one of the few groups that are well represented both in the Mississippi Valley and

* See p. 143.

Atlantic drainage areas, which in the main are peopled by very different *Unio* faunas.

The species which are the subject of this note, though closely related and having about the same geographical distribution, are no doubt distinct, and when one has learned to separate them he rarely has any difficulty in distinguishing them at sight. As a rule, *Unio ochraceus* is the more inflated and thinner shell of the two; it is almost invariably dull-colored, and the epidermis, especially at the posterior end is generally raised into slight irregular folds, which follow the growth lines. The rays, which are dirty green and ill-defined, usually cover the posterior part of the shell, and sometimes extend over the whole disc, becoming fainter towards the anterior



Unio cariosus Say.

end. The interior is dull-colored, often lurid, and quite frequently tinted with reddish salmon or purple.

On the other hand, *Unio cariosus* is generally the more compressed of the two; often showing a fairly well-defined angle on the posterior slope; it is almost invariably smooth and shining; the epidermis being yellowish or a dirty straw color, sometimes tinted with brown. Usually above the posterior slope there are a few wavy, very distinct, dark green rays, and sometimes, though rarely, this radiation extends over the shell. The interior is usually white or silvery, and more or less iridescent posteriorly.

In a very large series any of these characters may fail. Specimens of *U. cariosus* may be inflated, or very rarely slightly roughened; there may be individuals of either species that are uniform in color, or rayed throughout, but in an extensive set they will, for

* See p. 143.

the most part, hold good; and the roughened, dull exterior, feeble rays, and lurid interior of *U. ochraceus*, and the shining epidermis and well defined posterior rays of *U. cariosus* are very constant. *Unio cariosus*, on the whole, approaches much closer to forms of *U. occidens* than it does to *U. ochraceus*.

The latter ranges from the Connecticut River and the state of New York, south in the waters of the Atlantic drainage to Savannah, Ga. Two specimens from the latter locality have remarkably red interiors, and are a little peculiar, but are undoubtedly the species in question. *Unio cariosus* is found in the vicinity of Quebec, Canada, according to Latchford, and it has been reported from western New York. A doubtful specimen is in the Lea collection from Talledega, Ala. It is in the same collection from Edgefield, S. C., Ogeechee River, Ga., and Columbus, Ga., and these are no doubt correctly named. Other shells in the Lea collection from Nashotch, Wis., and Ontonagon, Mich., are very probably forms of *Unio occidens*.

NOTES ON THE REPORTED EXTINCTION OF THE GENUS ACHATINELLA AND MARVELOUS DEVELOPMENT OF A FLORIDA FASCIOLARIA.

BY JOHN FORD.

A most extraordinary account of a collection of shells, located somewhere in the interior of New York State, was handed me by a friend a few days ago.

This purports to have been written by a correspondent of a Rochester newspaper, in the columns of which the article probably first saw the light. The writer, it appears, does not claim any scientific knowledge of shells, nor can it positively be said that his bump of imagination is abnormally developed. Nevertheless, he has given to the paper alluded to, and consequently to the world, some very remarkable bits of information. Information, indeed, which, if true, shows how puny are the geographical and scientific acquirements of the general run of conchological students. Of course, for lack of space in your columns, reference can only be made to one or two of the marvelous statements embraced in the article. One of these refers to the genus *Achatinella*, of which the writer says, "This shell is confined to the Sandwich Islands and its tenant feeds on the

herbage of these islands. Since the islands have been pastured, the 'variety' has almost entirely disappeared, and probably not more than a half dozen specimens could be found there to-day." What a dire calamity! and how remarkable that these pretty little creatures should have "shuffled off their mortal coils" in the very season that less regal robes slipped trom the shoulders of their Island Queen.

A few flippant students may question this tale of *starvation* in the midst of *green pastures*, but it will perhaps be well for them to pickle their opinions, since the positive assertions of "correspondents" are not to be trifled with. The shell expert who can doubt this starvation story would quite as likely question the following narrative said to have been written by the "experienced collector" who forwarded the shell referred to, to the aforesaid unparalleled New York aggregation, viz.; "The large Florida *Fasciolaria* father found one day by accident.

"While drifting about in Florida waters his boat suddenly touched what seemed to be a rock but it proved to be an immense specimen of the Fasciolaria (sic), alive and travelling." "This specimen weighs several hundred pounds."

A brief statement to be sure, but a graphic one, as the reader will admit. There is not a word, however, as to whether the boat was wrecked in its "sudden" contact with the limy mass "weighing several hundred pounds."

Nor is there any reference to the final disposition of that part of "the Fasciolaria" which, when struck, was "alive and travelling." But this fact matters little, perhaps, since we are assured that the "several hundred pounds" were gotten safely to the shore, and finally into that collection of shells which (I quote again) "is expected to be in a short time the most complete and valuable one, from a scientific standpoint, in the world."

Presumably this monster of "Florida Waters" is known to Science as *Fasciolaria gigantea*, but alas! how pitiable has been the ignorance of the scores of so-called conchological experts who have hitherto believed that this, the largest species of the genus, did not exceed a paltry ten pounds in weight. Think of it, ye academic plodders who for years have been gazing with wonder upon a petty *eight* pounder, imagining the while that Florida had utterly failed to produce anything larger in the same line. O, the pity of it! You that have given years of study and thought to the molluscan world,

how could you so mistake a pigmy for a giant, a veritable baby for a grandfather? Far better would it have been had you made a Mecca of the Empire State and sat at the feet of its astute correspondent, whose present throne is, doubtless, ye same old Fasciolaria, "alive and travelling" and "weighing several hundred pounds."

NOTE ON HELIX SAULIÆ PFR (non REEVE)=PALUMBA SOUVERBIE.

BY HUGH FULTON, LONDON.

Owing to an error in Reeve's Monograph some confusion has been caused as to the identity of the above species; both Pilsbry and Hidalgo have taken Reeve's description and figure (Conch. Icon., fig. 393) as being that of the type of *sauliæ*, consequently, and with reason, they have considered the *palumba* of *Souverbie* to be distinct from the former species. The fact is, that when Reeve described and figured his *sauliæ, he had not the type of that species before him;* the type specimen of Pfeiffer's *sauliæ* in the Cumingian collection, is identical with the *palumba* of *Souverbie*, Journ. de Conchyl., 1858, p. 369; 1862, t. 10, f. 5.

I have not been able to find in the Cumingian collection the shell figured by *Reeve*.

SHELLS OF AROOSTOOK CO., MAINE.

COLLECTED BY OLOF O. NYLANDER.

The species listed below were collected in the vicinity of Caribou, Maine. Aroostook County is the northern county in Maine, and very few species have hitherto been reported from there. The specimens of *Limnæa* and *Planorbis* show great variation, the forms of *L. emarginata* are especially interesting.

Vitrina limpida Gld. Caribou.
Vitræa arborea Say.
Conulus fulvus Mull.
Pyramidula alternata Say. Woodland.
Pyramidula striatella Anth.
Pyramidula lineata Say.
Polygyra albolabris Say. Woodland.
Polygyra dentifera Binn. Woodland.

Polygyra sayi Binn. Woodland.
Polygyra monodon Say. Woodland.
Strobilops labyrinthica Say.
Pupa pentodon Say. Woodland.
Vertigo gouldi Binn. Woodland.
Ferussacia lubrica Mull.
Succinea obliqua Say. Woodland.
Succinea ovalis Gld. Aroostook Co., Me.
Carychium exiguum Say. Generally diffused.
Limnæa humilis Say.
Limnæa desidiosa Say.
Limnæa emarginata Say.
Limnæa emarginata mighelsi W. G. B.
Planorbis trivolvis Say.
Planorbis bicarinatus Say.
Planorbis bicarinatus aroostookensis Pils.
Planorbis campanulatus Say.
Planorbis deflectus Say. Streams generally. Very large specimens in inlet of Cross Lake.
Physa ancillaria Say. Square Lake.
Physa heterostropha Say. Generally abundant.
Campeloma decisum Say. Lakes and Streams.
Pomatiopsis cincinnatiensis Lea. Caribou Lake.
Unio complanatus Sol. Lakes generally. Some are very large.
Margaritana margaritifera L. Aroostook R. (rocky bottom).
Margaritana undulata Say. Square Lake.
Anodonta fragilis Lam. Caribou L. (mud bottom).
Sphærium sulcatum Lam. Salmon Brook Lake.
Sphærium striatium Lam. Square Lake.
Pisidium variabile Prime. Caribou Lake.
Pisidium abditum Hald. Caribou Lake.

NEW SPECIES OF LAND-SHELLS FROM THE GALAPAGOS ISLANDS.

BY WILLIAM H. DALL.

Bulimulus (Næsiotus) Reibischii n. s.

Shell elevated, slender, of a pale ferruginous tint, rather solid, with nine whorls; apex funiculate as in other Nesiotes, the first two (nepionic) whorls finely ribbed and polished, the remainder with numerous oblique or irregular transverse ribs crossed by nu-

merous sharp spiral threads, with wider interspaces; suture distinct, somewhat appressed; base of last whorl somewhat attenuated; whorls little inflated, but not flattened; umbilicus a mere chink; aperture oval, higher than wide, rounded in front, the pillar simple, the margins thickened but not reflected. Lon. 11·0; max. diam. 2·5 mm.

This shell has the sculpture of *B. rugiferus* Sby., and somewhat the form of *B. chemnitzioides* Fbs., though shorter and with fewer whorls. It is fairly intermediate between *Næsiotus* and *Pleuropyrgus*. Two specimens were collected by the U. S. S. Albatross at Indefatigable Island. The species is named in honor of Herr Paul Reibisch who has recently worked up the Wolf collection from these islands.

Bulimulus (Næsiotus) Fanneri n. s.

Shell short, stout, pointed, with six whorls of which two are nepionic with the usual sculpture, while the others are marked only by lines of growth and microscopic, inconstant spiral striation, of which the most prominent lines are regularly spaced and microscopically beaded, when present; color pinkish or slightly brownish white, no peripheral pale band visible on the specimens which, however, are not perfectly fresh; whorls well rounded, umbilicus large and deeply pervious; aperture large, with a widely reflected lip, the outer lip much bent over on the body, closely approaching the pillar and united to it by a distinct callus. Lon. 11·0; max. diam. 7·0 mm.

This belongs to the *B. jacobi* group, and is about the size of small varieties of *jacobi*, but is more conical and stouter, and has an aperture very differently shaped and with a more broadly reflected lip than any other species from these islands. It was found with the preceding and is named in honor of Capt. L. L. Fanner, commander of the Albatross. The pillar is perfectly plain and with no sulcus or fold at the base.

NOTE ON TASMANIAN ACMÆA AND ISCHNOCHITON.

BY H. A. PILSBRY.

Acmæa cantharus Reeve.

The habitat of this species was said, by Reeve, to be New Zealand; but Prof. Hutton, some years ago, corrected this error, stating that

it is Tasmanian. Numerous specimens received from Mr. H. Suter, collected by Mr. W. L. May, at Frederick Henry Bay, Tasmania, show a considerable range in pattern of coloring. The interior is very much like that of *Lottia gigantea*, and the anterior, marginal position of the apex also forcibly recalls that West American species.

Acmæa parva Angas, var. **tasmanica** n. v.

Shell smaller, wider and higher than "*Nacella*" *parva* Ang. (P. Z. S., 1878, pl. 54, f. 12), opaque white, with radial irregular rays of bluish or subtranslucent white at the sides and short, transverse bars of the same on the back. Length 8, breadth 2·2, alt. 1·5 mm. Estuary of Derwent R., Tasmania, 10 fms. Collected by Mr. W. L. May.

Ischnochiton (Haploplax) Mayi n. sp.

Shell short-oval, moderately elevated, carinated, the side-slopes slightly convex. Surface smooth to the naked eye, but finely granular. *Color of valves and girdle uniform black* above, or slightly brownish at the beaks when eroded.

The intermediate valves have almost straight sutures, even a trifle concave in old specimens, the beaks projecting a trifle in young ones. *Lateral areas distinctly raised* (*the diagonal distinct* and rather wide), sculptured with several arcuate, indistinct growth-marks, sometimes showing very slight traces of coarse, low pustules, but these are hardly mentionable; all over minutely granulose in diamond pattern. Central areas with faint growth-striæ anteriorly, distinctly granulose at the sides, the granules arranged to form forward-converging riblets, which, though slight, are apparent on the outer half of each valve; central portion of central areas smoothish, with faint granulation only, beaks smooth. End valves sculptured like lateral areas. Valve viii with mucro projecting, at about the anterior third; the posterior slope concave below the mucro and then straight.

Interior dull blue-green, greener behind the rather heavy valve-callus, the depth of the cavity rather lead-color. Sutural laminæ small, projecting less than half the length of a valve; sinus wide. Slits in valve i, 11; valves ii to vii, 1–1; valve viii, 12–13. Teeth sharp, smooth and short.

Girdle black, clothed with densely imbricating, coarse, convex, smooth scales.

Length 8, breadth 6 mm.; larger, "curled" examples would measure at least 10 mm. long. Divergence the same as in *I. smaragdinus.*

Eagle Hawk Neck, east coast of Tasmania. Collected by Mr. W. L. May, and communicated to me by Henry Suter.

This species belongs to the group of smoothish Australian species, such as *lentiginosus* Sowb., *smaragdinus* Angas and *virgatus* Reeve. It has more distinctly differentiated lateral areas and better developed pleural sculpture than any of them, and is, moreover, of a uniform black color. Types in coll. Acad. Nat. Sci., Phila.

In this connection it may not be out of place to direct attention to certain errors in the volume on Chitons in the Manual of Conchology. By the study of many specimens received from Messrs BEDNALL and COX, I find that two species were "lumped" under the name *Ischnochiton contractus.* (1) *I. decussatus* Reeve, of which *castus* Rve. and *speciosus* Ad. and Ang. are synonyms, and (2) *contractus* Reeve, of which Mr. Sykes considers *pallidus* Reeve a synonym. On account of the inadequate illustration and description of Reeve's *C. crispus*, I did not recognize it in my *Isch. haddoni;* but upon sending specimens of the latter to Mr. E. R. Sykes for comparison with Reeve's type, he informs me that they are the same. While something might be said in favor of ignoring Reeve's name on the score of insufficient definition, it may, in the long run, be better to receive it and make my own *I. haddoni* a synonym of *I. crispus.* I regret the change, because my intention was to honor Prof. HADDON, whose work on Chitons, as well as in other departments of Zoology, is of great merit; and a synonym is rather a doubtful honor.

NEW SPECIES OF LAND SHELLS FROM PUGET SOUND.

BY WM. H. DALL.

In some minute shells sent for examination by Mr. P. B. Randolph, of Seattle, after eliminating species already known, two forms appeared to be inedited. Having sent them to Mr. Pilsbry for criticism, he agrees that they are new, and the following descriptions are submitted.

Patulastra? (Punctum?) pugetensis n. s.

Shell minute, pale greenish yellow, nearly smooth, the first whorl and a half smooth, the others with fine, silky, close-set, hardly elevated lines or minute regular riblets, somewhat flexuous and in harmony with the incremental lines; form moderately elevated, the whorls inflated with a deep suture, and, in the adult, rapidly enlarging near the aperture in the latter part of the last whorl; aperture large, quite oblique, almost circular, the segment of the body between the two lips about one-sixth of the whole; umbilicus ample, scalar, exhibiting part of all the whorls which make, in adults, from three to three and a quarter volutions.

Alt. 0·5; max. diam. 1·5, min. diam. 1·2 mm. Habitat, Seattle, Wash., under leaves.

Pyramidula? Randolphii n. s.

Shell minute, reddish brown, with dull silky lustre, elevated, with three and a half rather inflated whorls; sculpture only of fine incremental lines, barely perceptible under an ordinary triplet lens; suture deep, periphery rounded, slightly less so in the immature shell but seemingly never angular; aperture obovate, somewhat oblique, wider than high, the body segment about one third of the whole; top dome-like, base full, umbilicus small, subcylindric, deep.

Alt. 0·75, max. diam. 1·4, min. diam. 1·25 mm. Habitat, with the last.

This little shell recalls *Conulus fulvus* in form, but wants the polish and imperforate base, and is more elevated and inflated than *C. fulvus* of the same number of whorls. It is not unlike the little *Helix granum* Strebel on a smaller scale. It is named in honor of the gentleman who collected it, who is deeply interested in the mollusk fauna of the Sound region.

NOTES AND NEWS.

Portrait of Rafinesque.—We are informed that portraits, suitable for framing (12 x 14 inches), may be had for a nominal sum to cover postage and packing, by addressing *Prof. R. Ellsworth Call, Manual Training High School, Louisville, Ky.*

By error, the name of the author was omitted from the paper "Note on Unio oregonensis Lea," in the last number of the Nautilus. It should have been signed *Charles T. Simpson.*

NAVARCHUS.—In working upon the Tectibranchs for Vol. XVI of the *Manual of Conchology*, I find that the name *Navarchus*, applied to a group of *Doridiidæ*, is preoccupied. I propose, therefore, to substitute *Navanax*, the type being *N. inermis* Cooper.

PLEUROTOMARIA BEYRICHI.—A specimen of this rare species has lately been added to the National Museum Collection, which now possesses three of the four recent forms of the genus.

NOTE ON POTAMANAX.—The name given to this group of tropical American Melanians has been used again for a genus of *Lepidoptera* (Watson, *Hesperidæ*, P. Z. S., 1893, p. 55). As the signature of the Proc. Acad. Nat. Sci. Phila. containing the description of the mollusk genus was actually distributed on Jan. 24, 1893, and the paper containing the Lepidopterous genus was printed under the proceedings for Jan. 17, 1893, the latter has apparent priority. However, the proceedings of that meeting could hardly have been actually printed until some weeks after the meeting, so that it is extremely probable that the name of the Lepidopter is later in date of actual publication, and must, therefore, be changed.

We are indebted to Dr. W. D. Hartman of West Chester, Pa. for the illustrations of *Unio ochraceus* and *U. cariousus* in this number. They are from his *Conchologia Cestrica*, an excellent work describing and figuring the shells of Chester Co., Pa., and incidentally the majority of those of the Middle States.

ANATOMY OF HEMICYCLA.—Dr. A. Krause (Nachbl. D. M. Ges. Jan.-Feb. 1895, pl. 1) has recently dissected several species of this Canary Island group of *Helices*, and finds their anatomy to be practically identical with that of *Tachea*. The rank and position assigned the group in Pilsbry's "Guide to the Study of Helices" is therefore fully confirmed. Its relationships are not with the Madeira and Azores Helices of the genus *Leptaxis*, but with the forms of true *Helix* of the European and N. African mainland.

NEW PUBLICATIONS.

THE ZOOLOGICAL RECORD for 1893 has appeared, containing the records of Mollusca, Brachiopoda and Bryozoa, by Mr. B. B. Woodward. These digests of the literature of zoology are of such great utility, when well done, that we cannot refrain from congratulating the Zoological Society upon the admirable manner in which the present Recorder has performed his difficult task. Mr. Woodward should have the hearty coöperation of all the conchologists. His

labor would be materially lessened if authors would send him "separates" of their publications, as soon as issued, addressed to *The Editor of the Zoological Record, Zoological Society, 3 Hanover Square, London W., England.*

Description d'un Perideris nouveau [*P. lechatelieri*] provenant du Dahomey, par Ph. Dautzenberg (Journ. de Conch., 1893, pl. I).

Desc. d'une nouvelle espèce du genre *Littorina* provenant des côtes de la Tunisie, par Ph. Dautzenberg (J. C., '93, pl. I). *L. nervillei.*

Desc. d'une espece nouv. du genre *Chama* prov. des côtes océaniques de France, par Ph. Dautzenberg (Bull. Soc. Sc. Nat. de l'ouest de la France, 1892, p. 133, figs.). *Chama nicolloni.*

Contrib. a la faune malacologique des iles Sechelles, par Ph. Dautzenberg (Bull. Soc. Zool. France, 1893, p. 78). Contains important additions to the records in Martens' work in Möbius' Reise nach Mauritius, etc. No new species.

Cruise of the Steam Yacht "Wild Duck" in the Bahamas, etc., Notes on the Shells Collected, by Wm. H. Dall. (Bull. Mus. Comp. Zool. xxv, No. 9.) It appears that the lagoons of the Bahama Is. are peopled by a peculiar mollusk fauna, evidently derived from species living normally in the sea outside. The number of lagoon species is small, and they are all marked by (1) thinness of shell; (2) diminutive size; and (3) when colored at all, by brilliancy of color, as compared with their nearest relatives in the adjacent sea. Among others enumerated by Dall which are common to the sea and the lagoons, are the following which occur only in and are characteristic of the latter: *Cyrena colorata* Prime, *Venus* (*Anomalocardia*) *leplalea* Dall, *Tornatina parviplica* Dall, *Cerithium* (*Pyrazus*) *7-striatum* var *degeneratum* Dall, *Cerithium tenuis* Pfr.

A considerable list of land species is given, among them *Chondropoma watlingense* and *Cerion Agassizi* are new, the latter fossil. Dall calls attention to the fact that the name *Strophia* is preoccupied, and proposes to substitute *Cerion* Bolten, 1799, as Mörch had already done in 1850. He gives names to the subdivisions of the genus indicated by Maynard, as follows:

Cerion *s. s.* Parietal lamina short, situated in the angle between pillar and body-whorl; short internal sets of laminæ persistent; type, *uva.*

Strophiops Dall. Parietal lamina penetrating body-whorl to ¼, ½ or more its length, central, etc. Type *decunana* [not Fér.!= *regia* Bens.!–Ed.]

Maynardia Dall. Like Strophiops, but parietal tooth short; type *neglecta* Mayn.

Diacerion Dall. Parietal lamina double within, and penetrating one or two whorls; type *dalli* Mayn.

Eostrophia Dall, 1890. No teeth or laminæ. Type *E. anodonta* Dall, fossil in lower Miocene, Tampa Silex beds.

THE NAUTILUS.

VOL. VIII. APRIL, 1895. No. 12

MOLLUSK FAUNA OF PHILADELPHIA AND ENVIRONS.

BY MORRIS SCHICK.

In the Proceedings of the Academy of Natural Sciences of Philadelphia for 1861, page 306, Mr. W. M. Gabb has given a list of Philadelphia mollusks, enumerating 62 species, seven of which are, however, synonyms or doubtful inhabitants of this region. Having collected a number of species in this vicinity which are not on Gabb's list, the writer thought it well to make a new one, giving exact localities where the various species have been found during the last two or three years in the neighborhood of Philadelphia, and including not only those forms personally collected, but also the species and localities discovered by other local naturalists—Messrs. Walton, Vanatta, Stone, Pilsbry, McGinty, Johnson, Ford, Fox and Eisenhardt, all of whom have contributed materially to the list.

The importance of the Philadelphia fauna, as being the type locality of many of Thomas Say's species, will always render it of interest to those who study geographic variation; and moreover, an accurate local list is of value to conchologists in the future, in determining the ever fluctuating geographic limits of species and varieties. While many of the special localities herein recorded will be destroyed by the growth of the city, others situated in Fairmount Park, especially along the Wissahickon, will doubtless perpetuate within the city limits most of the species indefinitely; and the aquatic forms will survive at least as long as the Schuylkill furnishes the water supply of the city.

The west bank of the Schuylkill above Girard Avenue was a very good collecting ground, where one could find in good numbers *Polygyra hirsuta, P. thyroides, P. tridentata juxtidens, Pyramidula alternata, Gastrodonta ligera, G. suppressa, G. nitida, Vitrœa arborea,* and *Selenites concava,* with a few others not so common; but this place has been destroyed this year by the laying out of a drive. On the land shells of the park, see Ford, *Conchologists' Exchange,* II, p. 7.

In his list Mr. Gabb refers to *Helix labyrinthica* as common near Germantown; I have been able to find but three specimens of this species, after a dilligent search of three seasons. He also mentions *H. hirsuta* as one of our commonest species, but this is now also uncommon; while others are becoming rare, there are some species now quite common that are not mentioned in Mr. Gabb's list, such as *Limax maximus, Pyramidula striatella, Vallonia costata, Pupa contracta, Succinea obliqua, Sphœrium striatinum, S. transversum,* etc. *Helix egena* Say, a depressed form of *Conulus fulvus,* was described from ten miles above Philadelphia; and *C. chersina=fulvus* is reported in Gabb's list as found near Germantown by Tryon. It has not occurred to recent collectors.

Helix appressa, admitted by Gabb, on the evidence of one specimen found on E. K. Tryon's estate near Germantown, was evidently a lost cabinet specimen. *Amnicola lustrica* Say of Gabb's list is the half grown *Pomatiopsis lapidaria.* "*Margaritana rugosa* Say," is an evident pen error for *M. marginata* Say, which Gabb omits. *Unio fisherianus* reported from the Schuylkill above Girard Avenue bridge, one specimen, may have been an incorrect identification.

TESTACELLIDÆ.

[*Testacella maugei* Fér. Green house on School Lane, Germantown.]

SELENITIDÆ.

Selenites concava Say. Both banks of Schuylkill at Falls, and below; everywhere rare.

LIMACIDÆ.

[*Limax maximus* L. West Philadelphia and Darby, plentiful in cellars and green houses (Pilsbry); Wissahickon, uncommon; Laurel Hill Cemetery, common; Germantown (Vanatta)].

NOTE.—Introduced species are enclosed in brackets The authority cited for each special locality refers to that immediately preceding only, but many of the places have been visited by several collectors.

[*Limax agrestis* Müll. Abundant in and around the city, and varying much in coloration.]

Limax campestris Binn. Common in most suitable localities around the city.

ZONITIDÆ.

Gastrodonta suppressa Say. Belmont glen, common (H. E. Eisenhardt); Tulpohocken Valley, Germantown, uncommon; Perkiomen; Glenside (Johnson); Fisher's Station, Germantown (Stone).

"I found a few specimens of this shell on the farm of my friend Mr. Reuben Haines at Germantown." (Say.).

Gastrodonta ligera Say. Wissahickon, common; also near Strawberry Mansion and West Falls of Schuylkill.

Gastrodonta ligera Stonei Pils. Westville, N. J., common; Hollyoak, Delaware (Stone, TYPE locality).

Gastrodonta (*Zonitoides*) *nitida* Müll. Wissahickon; West Park; and Westville, N. J., common. In Nov., 1893, they were found near Strawberry Mansion, East Park, congregated in immense numbers under logs (Vanatta).

Gastrodonta (*Pseudohyalina*) *minuscula* Binn. Wissahickon, rare; West Falls of Schuylkill (Vanatta); Westville, N. J. (Fox).

[*Vitreæ* (*Polita*) *cellaria* Müll. Wissahickon, uncommon; Conshohocken (R. Walton); found also in cellars of dwellings.] This is the *Helix glaphyra* Say, described in Nicholson's Encyl., Amer. Ed., 1818. "Taken by Mr. G. Ord in his garden in Philadelphia." (Say.)

Vitræa arborea Say. Same locality as *G. nitida;* Fisher's Station, Germantown, common (Stone); Westville, N. J. (Fox).

Vitræa indentata Say. Wissahickon, uncommon; Westville, N. J., common; Fisher's Station, Germantown (Stone).

Vitræa radiatula Alder (*viridula* Mke.; *electrina* Gld.). Lansdowne Valley, a few specimens; Wissahickon, rare; near Falls of Schuylkill (E. G. Vanatta); Westville, N. J. (Fox).

ENDODONTIDÆ.

Punctum pygmæum minutissimum Lea. Gloucester Co., N. J. (Wm. J. Fox, NAUTILUS, IV, 113).

Pyramidula alternata Say. Wissahickon and Germantown, common; near Falls of Schuylkill (Vanatta); West Park (Ford); Perkiomen (Johnson); a pallid, spotless variety is found along the Wissahickon.

Pyramidula striatella Anth. West Park, common; Wissahickon, common; Westville, N. J., one specimen; near Strawberry Mansion, where, in Nov., 1893, they were found congregated in immense numbers (Vanatta).

Pyramidula (*Helicodiscus*) *lineata* Say. Lansdowne Valley, uncommon; Wissahickon, a few specimens; near Strawberry Mansion (E. G. Vanatta); Germantown (R. Walton; Stone); near 58th St. Station, P. W. & B. R. R. (Pilsbry); "Found by Robert E. Griffith, near Philadelphia." (Say.); Westville, N. J. (Fox).

HELICIDÆ.

Polygyra (*Triodopsis*) *thyroides* Say. West Park, common; Wissahickon, common; Westville, N. J., common; Monument Cemetery (E. G. Vanatta); Fisher's Station, Germantown, and Fern Rock (Stone).

Polygyra (*Triodopsis*) *albolabris* Say. Wissahickon; Laurel Hill Cemetery; Perkiomen (Johnson); Fern Rock, rare (Stone); Westville, N. J. (Fox).

Polygyra (*Triodopsis*) *tridentata* Say. Wissahickon, moderately common.

Polygyra (*Triodopsis*) *tridentata juxtidens* Pils. West Park, and Laurel Hill Cemetery, common.

Polygyra (*Triodopsis*) *fallax* Say [*H. introferens* Bld.]. Flat Rock Dam, rare (R. Walton); Monument Cemetery, rare (E. G. Vanatta); Atco, N. J. (Fox); "Presented to the Academy by Messrs. Hyde and Mason who found it in the vicinity of Philadelphia where it is not uncommon." (Say.)

Polygyra (*Stenotrema*) *hirsuta* Say. West Park, uncommon; near Strawberry Mansion (E. G. Vanatta); Perkiomen (Johnson).

Polygyra (*Stenotrema*) *monodon* Rack. Strawberry Mansion (Ford); Perkiomen (C. W. Johnson).

Vallonia pulchella excentrica Sterki. Ruins near School Lane, common; Falls of Schuylkill (E. G. Vanatta); Fisher's Station, Germantown, common (Stone).

Vallonia costata Müll. East bank of Schuylkill, at Flat Rock Dam, very common; Falls of Schuylkill (E. G. Vanatta).

PUPIDÆ.

Pupa armifera Say. Ruins near School Lane, common; Falls of Schuylkill (E. G. Vanatta).

Pupa contracta Say. Ruins near School Lane, common; east bank of Schuylkill, at Flat Rock Dam, uncommon; near Falls of Schuylkill (E. G. Vanatta); Fisher's Station, Germantown, common (Stone); Westville, N. J. (Fox).

Pupa pentodon Say. Near 58th St. Station, P. W. & B. R. R. Pilsbry); Falls of Schuylkill (E. G. Vanatta).

Pupa corticaria Say. On walnut trees, School Lane, Germantown, rare.

Pupa fallax Say. Tulpohocken Valley, Germantown (John Ford).

Vertigo ovata Say. Tulpohocken Valley, Germantown (John Ford); "Numerous specimens were discovered by Mr. Wm. Hyde, in the vicinity of this city." (Say.)

Strobilops labyrinthica Say. Tulpohocken Valley, Germantown, rare.

ACHATINIDÆ.

Ferussacia lubrica Müll. (*subcylindrica* Auct., not Linné). Ruins near School Lane, common; Falls of Schuylkill (Vanatta).

[*Opeas octona* Linné. Introduced in green houses; Horticultural Hall (Robt. Walton)].

SUCCINEIDÆ.

Succinea avara Say. Conshohocken, common (R. Walton); Westville, N. J., one specimen; Tabor (Stone).

Succinea ovalis Gould. Wissahickon, uncommon; Westville, common; near Strawberry Mansion (Vanatta).

Succinea obliqua Say. Wissahickon, very common; Westville, N. J., common. Typical locality.

PHILOMYCIDÆ.

Philomycus carolinensis Bosc. Wissahickon, common; West Park, uncommon; South of Darby; Glenolden, Delaware Co. (Vanatta); Fisher's Station, Germantown (Stone).

AURICULIDÆ.

Carychium exile H. C. Lea. Wissahickon, rare (type locality).

Carychium exiguum Say. Wissahickon; Westville, N. J. (Fox).

LIMNÆIDÆ.

Limnæa catascopium Say. Delaware and Schuylkill Rivers, and Canal at Manayunk, common.

Limnæa columella Say. Ruins near School Lane, common; lakes near Memorial Hall, common; Perkiomen Creek (Johnson);

Tabor (Stone); Ponds along the Darby Creek Branch of the Reading R. R.

Limnæa humilis Say. Common in most localities.

Limnæa desidiosa Say. Schuylkill River, common.

Planorbis bicarinatus Say. Delaware and Schuylkill Rivers; Canal at Manayunk, common.

Planorbis trivolvis Say. Same localities as *P. bicarinatus.*

Planorbis deflectus Say. Canal at Manayunk, moderately common; Kaighn's Point. N. J., two specimens.

Planorbis exacutus Say. Ditch, South Broad Street, uncommon.

Planorbis dilatatus Gld. Near School Lane, rare; Ponds, South Broad Street; Fisher's Station, Germantown (Stone).

Planorbis parvus Say. Ditch at Kaighn's Point, N. J., common; near Strawberry Mansion (Vanatta); Fisher's Station, Germantown (Stone); Westville, N. J. (Fox).

Segmentina armigera Say. Westville, N. J., common; ditch at Kaighn's Point, N. J., common; ponds at Point Breeze (H. A. Pilsbry).

ANCYLIDÆ.

Ancylus rivularis Say. Rancocas Creek, N. J., and Schuylkill R., near Columbia Avenue Bridge (E. G. Vanatta); Perkiomen Creek (Johnson); Westville, N. J. (Fox).

PHYSIDÆ.

Physa heterostropha Say. This is the most abundant species, being found in almost all streams, ditches and ponds of this vicinity.

Physa heterostropha ancillaria Say. Delaware and Schuylkill Rivers. The specimens found show all the stages between *heterostropha* and *ancillaria*; Westville, N. J. (Fox).

Aplexa hypnorum L. Glen Riddle, Del. Co.; ditch at Kaighn's Point, N. J., uncommon. This is probably the extreme southern limit of this species.

VALVATIDÆ.

Valvata tricarinata Say. Schuylkill River, uncommon; canal at Manayunk, common. (Typical locality.)

Valvata bicarinata Lea. Same locality as the preceding; Westville, N. J. (Fox).

AMNICOLIDÆ.

Amnicola limosa Say. Canal at Manayunk, common; Westville, N. J.; Delaware River, below Gloucester. Typical locality.

Amnicola limosa porata Say. Canal at Manayunk, uncommon; lakes near Memorial Hall, Fairmount Park, common; Perkiomen Creek (Johnson).

Amnicola granum Say. Ditch at Kaighn's Point, N. J., rare; Corinthian Basin (John Ford).

Gillia[1] *altilis* Lea. Common in Delaware and Schuylkill Rivers; also canal at Manayunk; Westville, N. J.

Pomatiopsis lapidaria Say. Delaware River near Westville, N. J., common; near Strawberry Mansion (Vanatta).

VIVIPARIDÆ.

Lioplax subcarinata Say. Schuylkill River and Canal at Manayunk, common; Delaware River, very abundant.

Campeloma decisum Say. Schuylkill River, and Canal at Manayunk, common; Delaware River, uncommon; Ponds near Point Breeze (Pilsbry).

PLEUROCERIDÆ.

Goniobasis virginica Gmel. Common in Delaware and Schuylkill Rivers; fine specimens at the mouth of Wissahickon Creek. Like many Goniobases, this species is dimorphic, the form with raised spirals (*multilineata* Say), occurring with the smooth specimens.

CYRENIDÆ.

Sphærium striatinum Lam. Delaware and Schuylkill Rivers; canal at Manayunk, common.

Sphærium sulcatum Lam. Cobb's Creek (John Ford).

Sphærium fabale Prime. Canal at Manayunk, uncommon.

Sphærium partumeium Say. Greenwich Point, S. Philadelphia (McGinty).

Sphærium transversum Say. Mouth of Wissahickon Creek; Dam in Tulpohocken Valley, Germantown, abundant; stream flowing from Lily pond near Memorial Hall (Vanatta); Westville, N. J. (Fox).

Pisidium virginicum Gmel. Delaware River; canal at Manayunk, uncommon; Rancocas Creek, N. J. (Vanatta).

Pisidium abditum Hald. Rock Run, uncommon; ditch at Kaighn's Point, N. J.; stream flowing from Lily pond near Memorial Hall (V.).

[1] *Gillia* in Mollusca has several months priority over the same name in Pisces.

Pisidium variabile Pme. Ditch at Kaighn's Point.

Pisidium compressum Pme. Canal at Manayunk.

UNIONIDÆ.

Unio complanatus Solander. Delaware and Schuylkill Rivers, very common; canal at Manayunk, very fine specimens; Muckinipallus Creek, Glenolden, Delaware Co. (Vanatta); Corinthian Reservoir (Ford).

Unio nasutus Say. Delaware and Schuylkill Rivers, common. Typical locality.

Unio radiatus Lam. Canal at Manayunk, abundant; Delaware River, not common.

Unio heterodon Lea, Canal at Manayunk, uncommon; canal in 27th Ward (John Ford); Neshaminy Creek (C. W. Johnson).

Unio ochraceus Say. Delaware River, common. (Type locality).

Unio cariosus Say. Delaware River, rare. (Type locality.)

Margaritana undulata Lea. Raccoon Creek, N. J.; Canal at Manayunk; Muckinipallus Creek, Glenolden, Delaware Co. (Vanatta); Neshaminy Creek (Johnson); "Delaware and Schuylkill Rivers" (Say).

Margaritana marginata Say. Tohickon Creek, Bucks Co.; Neshaminy Creek (C. W. Johnson); Muckinipallus Creek, Glenolden, Delaware Co. (Vanatta).

Anodonta fluviatilis Lea. Delaware and Schuylkill Rivers; canal, Manayunk, moderately common; Muckinipallus Creek, Glenolden, Delaware Co. (Vanatta); Wister's Dam, Germantown (Stone); Lily Pond near Memorial Hall (V.).

Anodonta fluviatilis Tryoni Lea. Typical localities, Schuylkill River above Phila., and Delaware River at League Island; Westville, N. J. (Fox).

Anodonta undulata Say. Canal, 27th Ward (J. Ford).

NOTE ON THE SPECIES OF VERONICELLA FOUND IN CENTRAL AMERICA.

BY T. D. A. COCKERELL, N. M. AGR. EXP. STA.

It must be confessed that our knowledge of the Central American forms of *Veronicella* is singularly inadequate, and the purpose of this note is mainly to draw attention to the matter, in the hope that those who have the opportunity will add to our information.

It may be as well to say at once, that for satisfactory work in this genus it is desirable to have at least a dozen mature examples of each species. Working with few examples, there is danger of taking varietal characters for specific ones, if the species is little known. Once the true specific characters have been ascertained from a good series, any single example, if mature, can be determined ; but it is quite otherwise when the form is new, or belongs to a species which has been described from only one or two examples.

From necessity, species in this genus have, in the past, usually been described from one or two specimens. The descriptions, if prepared with reasonable care, even without anatomical details, will, I believe, be easily recognizable hereafter. But at present we do not know, in very many cases, *which* of the characters mentioned in the descriptions are really specific, and consequently whether the assumed species are valid.

I do not wish to suggest that species of *Veronicella* ought not to be described without numerous examples. If naturalists were to wait in every case until the material was as abundant as they could desire, our knowledge of tropical species of many groups would hardly advance at all. When a student introduces a presumed new species of *Veronicella,* having carefully ascertained that it *differs* from all previously described forms, and in his description sets forth that difference, he undoubtedly does good service. We are not to be prevented from interesting ourselves in the forms of *Veronicella* because we do not always know whether we are dealing with species, races, or varieties. But we *should like* to know the real status of each form, and must consequently urge those who have the chance to collect material to do their best to obtain sufficient.

The first Central American *Veronicella* to be named was *V. olivacea* Stearns, 1871. It was found in Nicaragua and has been supposed to inhabit California also. Although it is practically certain that it is not a native of California, it has been described in works on North American mollusca on the supposition that it belonged to that fauna. I have seen a specimen from Nicaragua, and have given a few descriptive notes in Ann. Mag. Nat. Hist., Nov., 1890, p. 389. Mr. W. G. Binney has published a figure of this same specimen.

The next species was made known in the year following, 1872. This was *V. moreleti* Crosse and Fischer, from Mexico ; fulvous with two blackish bands, whereas *olivacea* has no dark bands.

In 1873 a second Mexican species was announced, *V. mexicana* Pfeffer, in Strebel's work on the fauna of Mexico, p. 130. It was 47 mm. long, red-brown to grey-brown and black-brown.

For many years no more additions were made; until in 1885 (or Jan. 1886?) Dr. Semper's elaborate work on the genus appeared. In this, on p. 293, we find *V. mexicanus* n. sp., from Mexico; but the author having discovered, too late to change the text, that there was already a species of that name, takes the opportunity of writing *V. strebelii* instead on the explanation to the plate. This *mexicanus* =*strebelii* is 51 mm. long, 15½ broad, with the female orifice 1½ mm. from sole and almost exactly equidistant from each end. On p. 316 of the same work, Semper describes a true *mexicanus* Pfeff., which he had from Strebel. It was found in Vera Cruz, and was whitish-flesh, only 20 mm. long, with the ♀ orifice a little hind of the middle. If this specimen was really of the same species as originally described in 1873, it must have been somewhat immature.

In the same work of Semper, p. 295, appears a Chilian species, *V. decipiens* Semper. This is supposed to be also a native of Mexico, but I think the latter habitat must be accepted with some reservation; unless perchance, it has reached there accidentally through human agency. It is dark yellowish-brown, with the mantle black-spotted, 42 mm. long, 16½ broad, ♀ orifice 1 mm. from sole, and somewhat *anterior to the middle.* This *V. decipiens* is very much like the Chilian *V. adspersa* Heynemann; so much so that one strongly suspects that they are forms of one species. They were published nearly at the same time, but I think *adspersa* has priority. Since Semper's work no further additions have been made.

In the British Museum are two other forms, which are the more interesting in that they represent new localities. They do not seem to be precisely identical with any of the described species, but all things considered, it seems preferable to leave them unnamed for the present. Descriptive notes are appended:

(1.) **Veronicella** sp. nov., vel **mexicana** var.

Long. (in alch.) 42½, lat. 20½, sole lat. 10 mm. ♀ orifice from head 22 (almost median), from sole 2 mm. Sole rather rounded posteriorly, not projecting beyond mantle, finely and closely transversely striate. Mantle above rugose-granulose, not at all papillate; color pale grayish-ochreous, above obscurely gray mottled, with the slightest indication of a dorsal and lateral dark band, only noticeable when looked for. Back arched, rounded. Upper tentacles grayish, lower pale ochery.

Honduras. Collector unknown. Heynemann had seen it when he visited the museum, and had written "nov. sp.?"

(2.) **Veronicella** sp. nov., vel **punctatissima** subsp.

Long. (in alch.) 41½, lat. 12, sole lat. 4 mm. ♀ orifice from head 21 (almost median), from sole 2½ mm. Sole very narrow, rounded behind, not projecting posteriorly, regularly and strongly transversely striate its edge longitudinally grooved. Mantle above thickly but rather irregularly impressed punctate, not papillate. Superior tentacles gray, lower pale ochrey.

Jaw brown, not very dark, with 36 very strong ribs. Penis tapering. Color variable, as follows:

(a) Pale ochreous, above brown from thick brown mottling, with a slightly indicated but quite observable pale dorsal line. *Below with sparse black mottling.* Six examples.

(b) Similar, but with more or less black spotting also above, though sparse. Four examples.

(c) Similar, but dark brown above, no pale dorsal line.

Panama, Volcan de Chiriqui. Collector unknown.

The interesting point may here be noted, that whereas the Nicaraguan *olivacea* and the Honduras species are typically Central American forms, and show a good deal of resemblance to the species of the greater Antilles, the Panama species is quite different, and belongs with the series of the lesser Antilles, Trinidad, etc.

NOTES AND NEWS.

UNIO CARIOSUS and OCHRACEUS.—By an unfortunate oversight, the wood-cuts of these two species in the March number were transposed. The figure on page 121 is *U. cariosus;* that on page 122 is *U. ochraceus.*

BYTHINIA TENTACULATA.—A new locality for this species is Black Lake, Holland, Michigan, Mr. L. H. Streng having collected adult and young in all stages of growth there.

MR. H. E. SARGENT, having spent some weeks in New England, has returned to his home at Woodville, Ala.

MR. JAMES M. DE LANEY has removed from Rochester to South Livonia, Livingston Co., N. Y.

NEW PUBLICATIONS.

DISTRIBUTION OF THE LAND AND FRESH-WATER MOLLUSKS OF THE WEST INDIAN REGION, and their Evidence with Regard to Past Changes of Land and Sea. By Charles Torrey Simpson (Proc. U. S. Nat. Mus., XVII, 1894).—After a statement of the geographic facts in regard to the region, and the depths of sea between and around the main islands, Mr. Simpson considers the means of distribution of the land and fresh-water mollusks from island to island, concluding that while some forms have been transported by drifting trees, etc., the main means of transport has been by means of former direct land connection of islands now separated. "There appears to be good evidence of a general elevation of the Greater Antillean region, probably some time during the Eocene, after most of the important groups of snails had come into existence, at which times the larger islands were united, and there was land connection with Central America by way of Jamaica. * * * At some time during this elevation, there was probably a landway from Cuba across the Bahama plateau to Florida, over which certain groups of Antillean land mollusks crossed. * * * There followed a period of general subsidence. During this the island of * * Jamaica was first isolated, then Cuba, and afterwards Haiti and Puerto Rico were separated. The subsidence continuing until only the summits of the mountains of the four Greater Antilles remained above water; then followed another period of elevation which has lasted until the present time. * * The Bahamas have appeared above the surface of the sea, either by elevation or growth, and have been peopled by forms drifted from Cuba and Haiti. The lesser Antilles have been peopled, for the most part, from S. America." These conclusions are based upon tables showing the distribution of species and genera on the various islands, and the later movements are supported by well-known geological facts. The evidence for the earlier elevation should be compared with Spencer's "Reconstruction of the Antillean Continent" (Bull. Geol. Soc. Amer., VI, Jan., 1895), founded upon a study of the supposed sunken river-valleys, and altogether supporting Mr. Simpson's conclusions. That the West Indian region actually stood *two miles* above its present level, as claimed by Spencer, is a proposition requiring much more proof than has been offered, to bring it out of the realm of mere suggestion or hypothesis; and we are certainly not prepared to endorse it; but the orogenic movements required to fulfill the conditions asked by Mr. Simpson are far more moderate, and, it seems to us, by all odds the most reasonable explanation of the facts of distribution. Mr. Simpson's paper concludes with the descriptions of *Sagda maxima*, *Neocyclotus bakeri*, *Lucidella costata* and *Pleurodonte bowdeniana* n. spp., from Jamaica, the latter three from the Miocene beds at Bowden.